**BIOCHEMISTRY**

**KROK 2019**

1. Enzymes are widely used as drugs in pharmacy. What is the main difference that separates enzymes from non-biologicalcatalysts?

+High specificity and selectivity

High universality

Low universality

High dispersion

High homogeneity

2. Parents of a 10-year-old child have made an appointment with endocrinologist due to complaints of the child’s low height. The child’s appearance is corresponding with that of a 5-year-old. What hormone causes such changes in physical development, if its secretion is disrupted?

+Somatotropic hormone

Adrenocorticotropic hormone

Thyroxin

Testosterone

Insulin

3. A patient complains of tachycardia, insomnia, weight loss, irritability, sweating. Objectively: the patient has goiter and slight exophthalmos. What gland is affected, and what functional disorder is it?

+Hyperthyroidism

Hypothyroidism

Hyperparathyroidism

Hypoparathyroidism

Adrenomedullary hyperfunction

4. Purine ring biosynthesis occurs in ribose-5-phosphate by gradual accumulation of nitrogen and carbon atoms and closing the rings. The source of ribose phosphate is the process of:

+Pentose phosphate cycle

Glycolysis

Glyconeogenesis

Gluconeogenesis

Glycogenolysis

5. What enzyme allows for synthesis of various genes from template-RNA to DNA in genetic engineering (this enzyme catalyzes the process discovered in RNA-viruses)?

+Reverse transcriptase

Exonuclease

DNA-ligase

Helicase

Endonuclease

6. Diet of an individual must contain vitamins. What vitamin is usually prescribed for treatment and prevention of pellagra?

+Vitamin PP

Vitamin C

Vitamin A

Vitamin B1

Vitamin D

7. Intracellular metabolism of glycerol starts with its activation. What compound is formed in the fi- rst reaction of its conversion?

+α-glycerolophosphate

Pyruvate

Lactate

Choline

Acetyl coenzyme A

8. The end product of starch hydrolysis is:

+D-glucose

D-fructose

Saccharose

Maltose

D-galactose

9. Accidental ingestion of death cap mushrooms containing α-amanitin causes intoxication. What enzyme is inhibited with this toxine?

+RNA polymerase II

DNA polymerase

DNA synthetase

Peptidyl transferase

Translocase

10. An ophthalmologist has detected increased time of dark adaptation in a patient. What vitamin deficiency can result in such symptom?

+A

C

K

B1

B6

11. A 70-year-old patient presents with cardiac and cerebral atherosclerosis. Examination revealed changes of blood lipid spectre. Increase of the following lipoproteins plays a significant role in atherosclerosis pathogenesis:

+Low-density lipoproteins

Very low-density lipoproteins

Intermediate density lipoproteins

High-density lipoproteins

Chylomicrons

12. A patient demonstrates milkywhite color of blood plasma due to high content of chylomicrons. Disintegration of triacylglycerol is disrupted. Deficiency of the following enzyme activity is observed:

+Lipoprotein lipase

Amylase

Tripsin

Cholesterol esterase

Lactase

13. A woman noticed that a cut on her skin was still bleeding even after 20 minutes had passed. What vitamin deficiency causes such condition?

+Vitamin K

Vitamin A

Vitamin D

Vitamin E

Vitamin B12

14. Primary structure of nucleic acids is a polynucleotide chain that has a certain composition and order of the nucleotides. What bonds stabilize this structure?

+3 , 5 –phosphodiester

Peptide

Glycosidic

Disulfide

Amide

15. Natural peptides can perform various functions. What bioactive peptide is a major antioxidant and performs coenzyme functions?

+Glutathione

Bradykinin

Oxytocin

Liberin

Anserine

16. An elderly man exhibits low levels of red blood cells and hemoglobin in blood; however, his color index is 1,3. Blood smear analysis revealed megaloblasts. What type of anemia is observed in this case?

+B12-folic acid deficiency

Iron-deficiency

Acquired hemolytic

Hereditary hemolytic

Chronic posthemorrhagic

17. After drinking milk a 1-year-old child developed diarrhea, flatulence. The baby is likely to have deficiency of the following enzyme:

+Lactase

Maltase

Aldolase

Hexokinase

Glycosidase

18. Patients with severe depression demonstrate decreased serotonin levels in brain and cerebrospinal fluid. What aminoacid is a serotonin precursor?

+Tryptophan

Threonine

Tyrosine

Glutamic acid

Aspartic acid

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

+Acetyl coenzyme A

Vitamin C

Glycine

Succinate

Cholesterol

20. A patient has icteric skin; unconjugated bilirubin content in blood is high; conjugated bilirubin in urine is not detected. There is significant amount of urobilin in urine and stercobilin in feces. Name the pathology characterized by given symptoms:

+Hemolytic jaundice

Obstructive jaundice

Jaundice of the newborn

Hepatocellular jaundice

Atherosclerosis

21. Cataract (lenticular opacity) has developed in a 52-year-old woman with diabetes mellitus. Lenticular opacity was caused by intensification of the following processes:

+Protein glycosylation

Lipolysis

Ketogenesis

Protein proteolysis

Gluconeogenesis

22. A patient with hyperproduction of thyroid hormones has been prescribed Merkazolilum. This drug inhibits the following enzyme participating in iodothyronine synthesis:

+Iodide peroxidase

Aromatase

Reductase

Decarboxylase

Aminotransferase

23. A patient consulted an ophthalmologist about deterioration of twilight vision and xerophthalmus. What drug should the doctor prescribe?

+Retinol

Pyridoxine

Tocopherol

Ascorbic acid

Cocarboxylase

24. A patient demonstrates symmetrical dermatitis on the palms. A doctor made a diagnosis of pellagra. What vitamin deficiency can result in such symptoms?

+Nicotinic acid

Cobalamin

Ascorbic acid

Folic acid

Cholecalciferol

25. The second stage of detoxification involves joining certain chemical compounds with functional groups of toxines. Select one such compound:

+Glucuronic acid

Higher fatty acids

Cholesterol

Glucose

Pyruvate

26. A patient undergoes chemotherapy with 5-fluorouracil that is a competitive inhibitor of thymidilate synthase. What process is inhibited by this drug?

+Thymidine monophosphate synthesis

Purine nucleotides disintegration

Adenosine triphosphate synthesis

Purine nucleotides salvage

Glucose synthesis

26. Universal system of biological oxidation of nonpolar compounds (numerous drugs, toxic agents, steroid hormones, cholesterol) is microsomal oxidation. Name the cytochrome that is included in oxygenase chain of microsomes:

+Cytochrome Р-450

Cytochrome C

Cytochrome A3

Cytochrome A

Cytochrome C1

27. Structure of proteins includes proteinogenic amino acids. What is the position of the amino group in the structure of these amino acids?

+α-position

β-position

γ-position

δ-position

-position

28. Name the disaccharide with the following structure:



+β-lactose

α-lactose

β-maltose

β-cellobiose

Saccharose

29. Chromatin contains positively charged histone proteins. What amino acid is contained in histone proteins in large amounts?

+Lysine

Alanine

Valine

Threonine

Serine

30. A man presents with signs of albinism: blonde hair, extreme photosensitivity, impaired vision. What amino acid metabolism is disrupted in the patient?

+Tyrosine

Methionine

Proline

Histidine

Valine

31. Substrate-linked phosphorylation occurs in the cycle of tricarboxylic acids. What compound takes part in this reaction?

+Succinyl coenzyme A

α-ketoglutarate

Acetyl coenzyme A

Succinate

Malate

32. Inhibition of the synthesis of bile acids from cholesterol in liver of an experimental animals has caused maldigestion of lipids. What is the role of these acids in the enteral lipidic metabolism?

+They emulsify dietary lipids

They keep balance of alkaline environment in the intestines

They participate in the synthesis of lipids

They are part of LDL

They activate the formation of chylomicrons

33. A patient with atherosclerosis has been prescribed Linaetholum containing essential fatty acids. Which of the following acids is an essential part of the preparation?

+Linolenic

Palmitic

Crotonic

Stearic

Oleic

34. In response to the administration of protein drugs, a patient developed an allergic reaction. The development of the allergic reaction is caused by the increased synthesis of the following compound:

+Histamine

Choline

Adrenaline

Histidine

Serotonin

35. The patient has icteric skin; unconjugated bilirubin content in blood is high; conjugated bilirubin in urine is not detected. There is significant amount of urobilin in urine and stercobilin in feces. Name the pathology characterized by the given symptoms:

+Hemolytic jaundice

Obstructive jaundice

Jaundice of the newborn

Hepatocellular jaundice

Atherosclerosis

36. A patient complains of pain in the small joints. High concentration of uric acid is detected in his blood plasma. What pathology causes such changes?

+Gout

Diabetes mellitus

Phenylketonuria

Lesch-Nyhan syndrome

Diabetes insipidus

37. Hemoglobin catabolism results in release of iron which is transported to the bone marrow by a certain transfer protein and is used again for the synthesis of hemoglobin. Specify this transfer protein:

+Transferrin (siderophilin)

Transcobalamin

Haptoglobin

Ceruloplasmin

Albumin

38. A patient has a mental disorder due to the insufficient synthesis of gammaaminobutyric acid in the brain. Such pathological changes might be caused by the deficiency of the following vitamin:

+Pyridoxine

Tocopherol

Cyanocobalamin

Folic acid

Riboflavin

39. The method consisting in removal of low-molecular impurities from colloidal systems and high-molecular compound solutions by semipermeable membrane diffusion is called:

+Dialysis

Electrodialysis

Ultrafiltration

Decantation

Compensatory dialysis

40. Fatty acids arrive into mitochondria, and there their oxidation occurs. Name the vitamin-like substance that takes part in transportation of fatty acids through mitochondrial membrane:

+Carnitine

Choline

Biotin

Pantothenic acid

Folic acid

41. A 5-year-old child presents with abdominal distension, abdominal cramps, and diarrhea occurring 1-4 hours after drinking milk. Described symptoms are caused by the lack of enzymes that break up:

+Lactose

Glucose

Maltose

Saccharose

Fructose

42. Albumine, blood serum proteins, and gastric juice pepsin consist of macromolecules of polypeptide chains that are joined with hydrogen bonds into hydrophilic spheres. These proteins are named:

+Globular

Fibrillar

Structural

Synthetic

Artificial

43. 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?

+Somatotropic hormone

Adrenocorticotropic hormone

Thyroxin

Testosterone

Insulin

44. 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?

+Pepsin

Amylase

Lipase

Dipeptidase

Hexokinase

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

+Cyclic adenosine monophosphate production

ATP breakdown into ADP and inorganic phosphate

ATP synthesis from adenosine monophosphate and pyrophosphate

ADP breakdown with adenosine monophosphate and inorganic phosphate production

ATP breakdown into adenosine monophosphate and pyrophosphate

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

+Catalase

Monoamine oxidase

Cytochrome oxidase

Aspartate aminotransferase

Lactate dehydrogenase

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

+Glutathione

Bradykinin

Oxytocin

Releasing hormone (Liberine)

Anserine

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

+Hypofunction of parathyroid glands

Hyperfunction of adrenal cortex

Hypofunction of adrenal cortex

Hyperthyroidism

Hypothyroidism

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

+Prostaglandines

Interleukines

Endorphines

Angiotensines

Enkephalines

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

+Unconjugated bilirubin

Conjugated bilirubin

Urobilinogen

Stercobilinogen

Bile acids

51. 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?

+Hypoglycemic coma

Hyperosmolar coma

Hyperglycemic coma

Hyperketonemic coma

Uremic coma

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

+Tyrosine

Asparagine

Glutamate

Tryptophan

Arginine

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

+Lactase

Maltase

Aldolase

Hexokinase

Glycosidase

54. 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?

+Folic acid

Lipoic acid

Biotin

Thiamine

Pantothenic acid

55. Ketoacidosis occurs during starvation. What metabolite blood concentration increase is symptomatic of this medical condition?

+Acetoacetate

Oxaloacetate

Malonate

Beta-hydroxy-beta-methylglutarylCoA

Acetyl-CoA

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

+Translation initiation

Translation termination

Transcription initiation

Transcription termination

Replication initiation

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

+Tryptophan

Phenylalanine

Valine

Arginine

Methionine

58. 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?

+Type I pancreatic diabetes

Type II pancreatic diabetes

Diabetes insipidus

Steroidogenic diabetes

Glycogenos

59. 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?

+Stercobilin

Conjugated bilirubin

Biliverdin

Unconjugated bilirubin

Verdohemoglobin

60. 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?

+Protein biosynthesis

DNA replication

RNA transcription

Post-translational modification of peptides

Post-transcriptional modification of RNA

61. Nucleoproteins contain signifi- cant amount of alkaline proteins. What propteins carry out structural function in chromatin?

+Protamines and histones

Albumines and globulines

Prolamines and glutenins

Hemoglobin and myoglobin

Interferones and mucin

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

+Hemolytic jaundice

Obstructive jaundice

Jaundice of the newborn

Hepatocellular jaundice

Atherosclerosis

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

+Oxidative phosphorylation

Substrate-linked phosphorylation

Microsomal oxidation

Lipid peroxidation

Oxidative decarboxylation

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

+Isoniazid

Heparin

Trimethoprim/sulfamethoxazole (Co-trimoxazole)

Streptomycin

Sulfanilamide

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

+Glucuronosyltransferase

ALAT

AspAT

Creatine phosphokinase

LDH1

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

+Phenobarbital

Heparin

Menadione sodium bisulfite

Sulfanilamide

Aspirin

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

+NADH-coenzyme Q reductase

Cytochrome oxidase

Cytochrome C reductase

Adenosine triphosphate synthetase

Succinate dehydrogenase

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

Flavin adenine dinucleotide (FAD)- containing monoamine oxidase (MAO)

Acetylcholinesterase

Formylkynureninase (Arylformamidase)

Kynurenine 3-hydroxylase

Lactate dehydrogenase

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

+Hyaluronidase, lecithinase

Lyase, ligase

Transferase, nuclease

Oxydase, catalase

Esterase, protease

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

+A

P

E

C

D

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

+Hypoglycemic coma

Hyperketonemic coma

Hyperglycemic coma

Hyperosmolar coma

Uremic coma

72. A patient complains of severe abdominal pain, cramps, blurred vision. His relatives exhibit the same symptoms. The urine is of red color. The patient has been hospitalized for acute intermittent porphyria. This disease might have been caused by the impaired synthesis of the following compound:

Bile acids

Insulin

+Heme

Collagen

Prostaglandins

73. It is known that malonyl-CoA is formed from acetyl-CoA and carbon dioxide under the influence of acetyl-CoA carboxylase. What vitamin is a coenzyme of this enzyme?

+Biotin

Ascorbate

Pantothenic acid

Folic acid

Thiamine

74. A patient with myocardial infarction has been administrated intravenously a direct anticoagulant, namely:

Vikasol

Calcium gluconate

Thrombin

Neodicumarin

+Heparin

75. A patient was admitted to a hospital in a state of hypoglycemic coma. It occurs at the following level of blood glucose:

3,3 mmol/L

4,0 mmol/L

5,5 mmol/L

+2,5 mmol/L

4,5 mmol/L

76. A patient with Parkinson’s disease exhibits low level of dopamine which is produced from dihydroxyphenylalanine (DOPA). What enzyme catalyzes this convertion?

Deaminase

+Decarboxilase

Carboxypeptidase

Aminotransferase

Hydrolase

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

Enkephalins

+Kinins

Leukotrienes

Endorphins

Iodothyronines

78. Chronic pancreatitis is accompanied by the decreased synthesis and secretion of trypsin. This impairs the hydrolysis and absorption of the following substances:

Disaccharides

+Proteins

Polysaccharides

Lipids

Nucleic acids

79. In response to the administration of protein drugs, a patient developed an allergic reaction. The development of the allergic reaction is caused by the increased synthesis of the following compound:

Histidine

Cholin

Adreneline

+Histamine

Serotonin

80. Diabetes and starvation cause the excess production of ketone bodies that are used as an energy source. They are produced from the following compound:

Isocitrate

Lactate

+Acetyl-CoA

Malate

Ketoglutarate

81. The intracellular metabolism of glycerol starts with its activation. What compound is formed as result of the first reaction of its conversion?

Lactate

Choline

Acetyl coenzyme A

+Alpha-glycerolphosphate

Pyruvate

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

Thiamin

Biotin

+Folic acid

Pantothenic acid

Lipoic acid

83. Vitamin B1 deficiency has a negative effect on a number of processes. This is caused by the dysfunction of the following enzyme:

+Pyruvate dehydrogenase complex

Succinate dehydrogenase

Aminotransferase

Lactate dehydrogenase

Glutamate

84. During the gastric secretion, proteolytic enzymes are secreted in form of zymogenes. What enzyme is activated by hydrochloric acid?

Trypsin

+Pepsin

Chymotrypsin

Amylase

Lipase

85. The anti-tumor preparation Methotrexate is a structural analogue of folic acid. The mechanism of its action is based on the inhibition of the following enzyme:

+Dihydrofolate reductase

Creatine kinase

Xanthine oxidase

Lactate dehydrogenase

Hexokinase

86. A child exhibits physical and mental retardation. Urine analysis revealed high concentration of orotic acid. This disease can be addresses by the constant use of:

Glutamine

Guanine

Adenine

+Uridine

Alanine

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

Aspartate aminotransferase

Succinate dehydrogenase

Glutaminase

+Asparaginase

Citrate synthase

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

Breakdown of glycogen

Breakdown of proteins

Gluconeogenesis

+Synthesis of glycogen

Breakdown of lipids

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

Activation of acetylcholinesterase

Inhibition of xanthin oxidase

Activation of monoamine oxidase

Inhibition of acetylcholinesterase

+Inhibition of monoamine oxidase

90. A 40-year-old male presented to the endocrinology department with disproportionate enlargement of limbs, mandible and nose. These manifestations are caused by the overproduction of the following hormone:

+Somatotropin

Adrenalin

Vasopressin

Corticotropin

Aldosterone

91. After drinking milk a 1-year-old child developed diarrhea, flatulence. The baby is likely to have the deficiency of the following enzyme:

Hexokinase

Glycokinase

+Lactase

Aldolase

Maltase

92. A child with PKU has an unpleasant mouse-like odor, growth retardation, mental retardation. These symptoms are associated with the high concentration of the following substance in blood:

+Phenylpyruvic acid

Uric acid

Cholesterol

Adrenaline

Glucose

93. Sulfanilamides are widely used as bacteriostatic agents. The mechanism of antimicrobial action of sulfanilamides is based on their structural similarity to:

Glutamic acid

Folic acid

+Para-aminobenzoic acid

Nucleic acid

Antibiotics

94. A patient with hyperproduction of thyroid hormones has been prescribed Merkazolilum. This drug inhibits the following enzyme of iodothyronine synthesis:

+Iodide peroxidase

Reductase

Decarboxylase

Aromatase

Aminotransferase

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

Glucose

+Bilirubin

Uric acid

Ketone bodies

Creatinine

96. Hemoglobin catabolism results in release of iron which is transported to the bone marrow by a certain transfer protein and used again for the synthesis of hemoglobin. Specify this transfer protein:

Ceruloplasmin

Albumin

Haptoglobin

Transcobalamin

+Transferrin (siderophilin)

97. A patient was found to have a tumor of pancreatic head, which is accompanied by the impaired patency of the common bile duct. Blood test will reveal an increase in the following substance level:

+Bilirubin

Insulin

Urea

Hemoglobin

Adrenalin

98. Sulfanilamides inhibit the growth and development of bacteria. The mechanism of their action is based on the impairment of the following acid synthesis:

Lipoic

+Folic

Pangamic

Nicotinic

Pantothenic

99. Addison’s (bronze) disease is treated with glucocorticoids. Their effect is provided by the potentiation of the following process:

Glycogenolysis

Glycolysis

Pentose phosphate cycle

Ornithine cycle

+Gluconeogenesis

100. A patient exhibits small (petechial) hemorrhages under the skin and mucous membranes, bleeding gums, tooth decay, general weakness, edemata of the lower extremities. What vitamin deficiency can be suspected?

E

+C

B1

A

D

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

Glycoproteins

Metalloproteins

Lipoproteins

+Purine nucleotides

Ketone bodies

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

+MAO (monoamine oxidase)

AST (aspartate aminotransferase)

CPK (creatine phosphokinase)

ALT (alanine aminotransferase)

LDH (lactate dehydrogenase)

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

+Asparaginase

Succinate dehydrogenase

Aspartate aminotransferase

Glutaminase

Citrate synthetase

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

+γ-globulins

α1-globulins

β-globulins

α2-globulins

Albumins

105. The intercellular metabolism of glycerol starts with its activation. What compound is formed in the first reaction of its conversion?

+Alpha-glycerolphosphate

Lactate

Choline

Pyruvate

Acetyl coenzyme A

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

+Glycosidic

Amide

Peptide

Hydrogen

Phosphodiester

107. The patient uses a daily basis for several raw eggs, which contain antivitamin biotin – avidin. Violations of any phase of lipid metabolism might arise?

+Fatty acid biosynthesis

Lipid transport in blood

Lipid absorption

Glycerol oxidation

Cholesterol biosynthesis

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

+Aldosterone

Acetylcholine

Vasopressin

Adrenalin

Somatostatin

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

+Low-density lipoproteins

Very-low-density lipoproteins

High-density lipoproteins

Intermediate-density lipoproteins

Chylomicrons

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

+Methionine

Glycine

Glucose

Bilirubin

Cholesterol

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

+Purine nucleotides

Ketone bodies

Glycoproteins

Lipoproteins

Metaloproteins

112. A 40-year-old patient has developed polyuria (10 -12 liters per day), and polydipsia induced by damage to the hypothalamic-hypophyseal tract. What hormone deficiency causes such disorders?

+Vasopressin

Somatotropin

Thyrotropin

Corticotropin

Oxytocin

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

+Folic acid

Pantothenic acid

Biotin

Lipoic acid

Thiamine

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

+Heart

Kidneys

Muscles

Stomach

Liver

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

+2,4-dinitrophenol

Antimycin A

Carbon monoxide

Lactic acid

Acetyl-CoA

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

+Tyrosinase

Hexokinase

Arginase

Histidine decarboxylase

Carbonic anhydrase

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

+Glycogen synthesis

Glycolysis

Pentose phosphate pathway

Lipolysis

Protein phosphorylation

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

+Tryptophan

Methionine

Valine

Phenylalanine

Arginine

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

+3′,5′-phosphodiester

Disulfide

Peptide

Glycosidic

Amide

120. Alkaptonuria is characterized by an excessive urinary excretion of homogentisic acid. Development of this disease is associated with disorder of the following amino acid metabolism:

+Tyrosine

Tryptophan

Alanine

Methionine

Asparagine

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

+Phenylalanine

Malate

Lactate

Succinate

Aspartate

122. Under various diseases in support of diagnosis analysis of the protein blood fractions is carried out in biochemical laboratories with the help of electrophoresis. What protein feature is this method based on?

+Availability of charge

Big molecular weight

Optical activity

Ability to swell

High viscosity

123. In pharmaceutical industry some proteins, which are used as preparations for treatment, are isolated from the biological liquids. Point what method is used for this purpose:

+Salting-out

Denaturation

Electrophoresis

Sequencing

Dialysis

124. In medical practice preparations of protein hydrolyzate are used for parenteral nutrition. Value of the hydrolyzates is determined by presence of the essential amino acids in them. Point, which from the listed amino acids is essential:

+Methionine

Tyrosine

Alanine

Glycine

Cysteine

125. One of the amino acids active form serves as a methyl group donator for pharmaceutical [drug] substance methylation. Choose it:

+Methionine

Glutamine

Glutamate

Cysteine

Glycine

126. Albumins are blood serum proteins that are synthesized in the liver and fulfil sertain functions. Point one of them:

+Pharmaceutical substances transportation

Thrombi formation

Carbon dioxide (gas) transportation

Oxygen transportation

Antibody production

127. Interferon was revealed under electrophoretic separation of the ill person blood serum. What fraction does this protein belong to?

+Gamma–globulins

Albumins

Beta-globulins

Alpha–2-globulins

Alpha–1-globulins

128. Irreversible changes of the protein conformation are observed during heat treatment of food. This process is named:

+Denaturation

Renaturation

Salting-out

Dialysis

Aquation

129. Preparation tannin is used in practical medicine as an astringent under acute and chronic sicknesses of the intestines. The astringent action of tannin is connected with its ability to:

+Denaturate proteins

Hydrolyze proteins

Renaturate proteins

Salting-out proteins

Oxidize proteins

130. Proteins have several levels of the three-dimensional structure. What bonds take part in the formation of the secondary structure?

+Hydrogen

Van der Waals forces

Ether

Hydrophobic

Ionic

131. Basis of the amino acid structural classification is the structure of their side chain. Which of the listed amino acids is basic?

+Lysine

Proline

Alanine

Leucine

Methionine

132. Level of blood total protein is one of the metabolism indices in the human organism. A quantitative determination in clinicodiagnostic laboratories is based on:

+Biuret test

Ninhydrin test

Xanthoprotein test

Fole reaction

Nitroprusside test

133. One of protein functions is a protection of the organism from infectious diseases. What preventive antiviral preparation of nonspecific defence is recommended at the time of influenza epidemic?

+Interferon

Thymosin

Thymolin

Albumin

Sulfacetamide

134. A patient with the damaged esophagus was recommended a parenteral feeding. Point, which from the listed preparations belongs to such a group?

+Hydrolysine

Asparkam

Rheopolyglucin

Polyglucin

Panangin

135. Biosynthesis of collagen – main protein of the connective tissue – includes co- and post-translational modifications that lead to the mature collagen fibril formation. In the basis of collagen formation is the process of:

+Hydroxylation

Proteolysis

Phosphorylation

Carboxylation

Glycosilation

136. Albumins show the most electronegative properties under electrophoretic division of the blood serum proteins. What amino acid that is contained in molecules of albumins determines their acidic properties?

+Glutamic acid

Leucine

Lysine

Alanine

Tryptophan

137. A structural specificity of fibrillar proteins is in forming of multimolecular filiform complexes – fibrils that consist of some parallel polypeptide chains. Name a fibrillar protein that is included in the composition of hair, skin, nails.

+Alpha-keratin

Albumin

Prothrombin

Globulin

Histone

138. In case of insufficient uptake or abnormality in formation of lipotropic factors in the human organism fatty degeneration of the liver appears. Which of the listed compounds is lipotropic?

+Choline

Cholesterol

Cholic acid

Pyridoxine

Nicotinamide

139. Bile acid preparations are sometimes recommended with the preparation “Festal” (contains the pancreatic enzymes) for the improvement of digestion under pancreas secretory insufficiency. What is the purpose of their usage?

+For emulsification of fats

For activation of the proteolytic enzymes

For activation of α- amylase

For stimulation of the pancreatic juice secretion

For stimulation of intestinal peristalsis

140. In a 60-year-old man with atherosclerosis some plasma membrane function abnormalities were observed because of the increasing of their harshness. What membrane compound content increase can lead to this?

+Cholesterol

Phosphatidylcholin

Glycolipids

Phosphatidylethanolamine

Proteins

141. A patient with ischemic cardiomyopathy was recommended to use fats which contain polyunsaturated fatty acids in the diet. Which of the listed fatty acids is polyunsaturated?

+Arachidonic acid

Oleic acid

Palmitic acid

Stearic acid

Myristic acid

142. A doctor prescribed an anti-inflammatory drug to a patient with ulcer. This drug is a derivative of prostaglandin E1. What compound is a metabolic source for that substance?

+Arachidonic acid

Butyric acid

Oleic acid

Palmitic acid

Stearic acid

143. Food fibers that are components of the plant cell wall fulfill an important part in prophylaxys of GIT diseases. What main polysaccharide is present in the plant cell wall?

+Cellulose

Starch

Glycogen

Inulin

Chondroitin sulfate

144. Main structural component of the plant cell wall is the homopolysaccharide cellulose. Like starch it contains glucose, but in contrast to the latter cellulose is not digested in the human GIT. Why?

+Because glucose residues in cellulose are connected by β-1,4-glycosidic bonds

They joined by α-1,4-glycosidic bonds

Because cellulose is not branched

As it contains galactose residues also

Because cellulose contains L-glucose

145. A 30-year-old man is under hypoenergetic condition that is connected with functional abnormalities of the electron transport chain cytochromes, which are by their chemical nature:

+Hemoproteins

Glycoproteins

Flavoproteins

Lipoproteins

Retinalproteins

146. Simple and conjugated proteins exist in the human organism. What is the difference between conjugated and simple proteins?

+Existence of non-protein part in the protein

Protein molecular conformation

Absence of non-protein part in the protein

Sequence of the amino acids in the protein

Quantity of the amino acids in the protein

147. Prosthetic group of conjugated proteins joins to the polypeptide by different bonds. The residuum of phosphoric acid is joined to the protein part of phosphoproteins by:

+ОН-group of serine

СООH-group of glutamine

СН-group of methionine

NH-group of lysine

SH-group of cysteine

148. Chylomicrons are formed in the wall of the small intestine after the absorption of fat components. What lipids are transported in the chylomicrons?

+Triglycerides, phospholipids, cholesterol and its esters

Only triglycerides

Triglycerides and phospholipids

Cholesterol and its esters

Phospholipids, cholesterol and its esters

149. Carbohydrate component of proteoglycans is represented by glycosaminoglycans (GAGs). Which from the glycosaminoglycans is localized mainly in the liver, lungs and vascular wall?

+Heparin

Hyaluronic acid

Keratan sulfate

Dermatan sulfate

Chondroitin sulfate

150. Changes in the blood lipoprotein level is an evidence of lipid metabolism pathology. Increase of which lipoprotein level can lead to the atherosclerosis development?

+Low density lipoproteins (β - LP)

Chylomicrons

High density lipoproteins (α - LP)

Structural lipoproteins

Intermediate density lipoproteins

151. Secretion of the ionized copper with urine and deposit of it in the tissues and organs is observed in a patient. Point the protein which synthesis abnormalities lead to these consequences.

+Ceruloplasmin

Transferrin

Properdin

Haptoglobin

Cryoglobulin

152. Pathological types of hemoglobin can exist along with the normal types in the adult organism. Point one of them.

+HbS

HbA2

HbF

HbСО2

HbO2

153. Hemoglobin is a conjugated protein that transports oxygen to tissues and takes out carbon dioxide (gas). Point, what class of the compounds it belongs to?

+Chromoproteins

Lipoproteins

Glycoproteins

Nucleoproteins

Metalloproteins

154. Preparation “Lidase” is used after burns, operations and also haematomas for the resolution of scars. This preparation contains an enzyme that decomposes:

+Hyaluronic acid

Keratan sulfate

Chondroitin-4-sulfate

Heparin

Dermatan sulfate

155. To a patient who suffers from joint disease, a doctor perscribed an ointment which active substance was a glycosaminoglycan – an important component of cartilage. What was this substance?

+Chondroitin sulfate

Heparin

Glycogen

Arabinose

Vitellin

156. In the process of hemoglobin catabolism ferrum is liberated. It then enters the bone marrow, and is again used for hemoglobin biosynthesis. What protein is ferrum transported in a complex with?

+Transferrin

Hepatocuprein

Albumin

Haptoglobin

Transcobalamin

157. What fraction is not revealed at electrophoretic separation of blood lipoproteins in a healthy human?

+Chylomicrons

Lipoproteins of intermediate density

VLDL

LDL

HDL -ЛВП

158. Nowadays in the tRNA structure more than 50 minor nitrogenous bases exept 4 major types were found out. Name one of them.

+Dihydrouracyl

Cytosine

Uracyl

5-methyluracyl

Adenine

159. We can determine the biochemical function of biologically active compounds in the organism when we know their structure.

+DNA

RNA

Proteins

Polysaccharides

Abnormalities of rhodopsin synthesis

160. What class of the biologically active compounds does polynucleotide (from deoxyribonucletides) belong to?

In a patient with cirrhosis an impairment in dark adaptation was observed. What can be the most likely reason of that?

+Abnormalities of vitamin A absorption in the intestines

Lack of vitamin A in the diet

Excess of vitamin A in the diet

Abnormalities of trans-retinal transformation into cis-retinal

Lipids

161. Nucleotides are monomers of the nucleic acids. What compounds can be found after complete hydrolysis of the ribonucleotides?

+Orthophosphoric acid, ribose, uracyl

Cytosine, thymine, orthophosphoric acid

Guanine, deoxyribose, orthophosphoric acid

Orthophosphoric acid, adenine, deoxyribose

Ribose, thymine, cytosine

162. Histones that have a positive charge are a part of chromatin. Which amino acid from the listed is the most prevalent in histones and carries a positive charge?

+Lysine

Threonine

Valine

Alanine

Serine

163. Nucleic acids provide storage and transmission of the hereditary information to progeny, and the mechanism of its realization. Which nucleic acid contains the information about quantity and order of amino acid residue interchange in the protein molecule?

+mRNA

tRNA

28S rRNA

18S rRNA

lnRNA

164. We can determine the biochemical function of biologically active compounds in the organism when we know their structure. What class of the biologically active compounds does polynucleotide (from deoxyribonucletides) belong to?

+DNA

RNA

Proteins

Polysaccharides

Lipids

165. In the last month of pregnancy a doctor prescribed “Vicasol” to a woman. Which vitamin analogue is it?

+Vitamin К

Vitamin В6

Vitamin В5

Vitamin А

Vitamin В12

166. Vitamin A is oxidized very quickly in an open air and loses its biological activity. Which component in food products prevents vitamin A from oxidation?

+Vitamin Е

Sugar

Protein

Fat

Vitamin РР

167. A 35-year-old patient in a pre-surgical period was prescribed vicasol (a synthetic analogue of vitamin K). What mechanism of action has this drug?

+Prothrombin synthesis stimulation

Plasminogen activation

Tissue thromboplastin synthesis stimulation

Hageman's factor activation

Complement system activation

168. In a 40-year-old woman with chronic kidney disease osteoporosis has developed. What compound deficiency is the main reason for this pathology?

+1,25 (OH)2 D3

1(OH) D3

Vitamin D2

25 (OH) D3

Vitamin D3

169. A woman took paediatrist’s advice about a bad state of health of her 8-month-old child: hyperhydrosis, increase of the fontanelle dimentions, delay in teeth eruption. What preparation should be administred first of all?

+Cholecalciferol

Cobalamin

Calcium gluconate

Thiamine bromide

Calcium pangamate

170. Isoniazid was prescribed to a 30-year-old man who was consumptive. Which vitamin hypovitaminosis would develop under a protracted course of therapy?

+Pyridoxine

Thiamine

Cobalamin

Biotin

Riboflavin

171. Thiamine pyrophosphate is the coenzyme synthesized from vitamin В1. Point out the process which this coenzyme participates in:

+Oxidative decarboxylation of pyruvate

Lipolysis

Gluconeogenesis

Glycolysis

Lipid absorption

172. In test animals a vitamin influence on citric acid cycle rate was investigated. What vitamin absence did not decrease the rate of the CAC reactions?

+Cobalamin

Thiamin

Riboflavin

Nicotinamide

Pantothenic acid

173. Ascorbic acid hypovitaminosis leads to scurvy. Synthesis of what protein is damaged under this pathology?

+Collagen

Albumin

Fibrinogen

Prothrombin

174. A patient eats every day some raw eggs which contain an antivitamin for biotin – avidin. What stage of lipid metabolism can be impaired in this case?

+Fatty acid biosynthesis

Lipid transport in blood

Cholesterol biosynthesis

Glycerol oxidation

175. Vitamins and vitamin-similar compounds are necessary for activation and carrying long-chain fatty acid through the inner mitochondrial membrane. Point one of them:

+Carnitine

Riboflavin

Ubiquinone

Biotin

Thiamine

176. For vitamin absorption certain conditions are necessary. An intrinsic factor (a glycoprotein secreted by the oxyntic cells of the stomach) is needed for the absorption of:

+Vitamin В12

Vitamin В5

Vitamin С

Vitamin В6

Vitamin В2

177. Lack of which vitamin leads to decreasing of the aminotransferase and decarboxylase activities?

+Vitamin В6

Vitamin В3

Vitamin В12

Vitamin В2

Vitamin В1

178. Antivitamin to what organic compound that is used by a bacterial cell for the folic acid biosynthesis (part of bacterial enzymes) sulfanilamide preparations are?

+Para-aminobenzoic acid

Nicotinic acid

Choline

Riboflavin

Pyridoxine

179. A patient with impaired immunity, susceptibility to catarrhal illness was recommended to take ascorutin as more effective medicine compared with ascorbic acid. What substance in this medicine enhances the vitamin C action?

+Vitamin Р

Vitamin А

Vitamin D

Glucose

Lactose

180. In the human organism most vitamins undergo some conversions. What vitamin takes part in the formation of the coenzyme of acylation (CoASH)?

+Pantothenic acid

Vitamin D

Vitamin С

Vitamin A

Vitamin К

181. A 50-year-old patient has hypovitaminosis of vitamin C (scurvy) connected with the imbalanced food. Decreasing activity of which enzyme is a basis of the conjunctive tissue lesion under these pathology conditions?

+Proline hydroxylase

Pyruvate carboxylase

Thryptophan hydroxylase

Alanine aminotransferase

Glutaminase

182. Parents of a 10-year-old boy appealed to a physician with a complaint about growth stop. During checkup the physician found the changes in mucous membranes and suspected cancerous anemia. He suggested that this pathology had been connected with a vitamin defficiency. Point, what vitamin defficiency might cause development of this state?

+Folic acid

Nicotinic acid

Orotic acid

Choline

Arachidonic acid

183. In the patient’s urine a certain compound that has an isoalloxazine ring in its structure have been found. What this compound is?

+Vitamin B2

Vitamin B5

Vitamin B6

Vitamin B1

Vitamin B3

184. Which vitamin is needed to maintain the conversion of pyruvic acid into acetyl-CoA?

+B1

B12

B6

C

D2

185. Vitamin B2 is included in the composition of flavin-related dehydrogenase coenzymes. Point out such a coenzyme.

+FMN

NAD+

NADP+

Coenzyme-A

TPP

186. Point the active form of vitamin D which functions in the system of homeostatic regulation of calcium metabolism and osteogenesis:

+24,25-Dihydroxycholecalciferol

Ergosterol

Ergocalciferol

Dehydrocholesterol

Cholecalciferol

187. A patient was diagnosed with hypoacidic gastritis and gastroduodenitis. The result of blood analysis – megaloblastic anemia. What substance deficiency caused the development of anemia?

+Gastromucoprotein

Ferrum

Mucin

Gastricsin

Trypsin

188. For treatment of cancer tumors methotrexate – a structural analogueof folic acid – is administred. This preparation is a competitive inhibitor of dihydrofolate reductase, that is why it inhibits the biosynthesis of:

+dTMP

dAMP

AMP

TMP

UMP

189. In patients with alcoholism disorders of the central nervous system - memory loss, psychoses are often observed. These symptoms are caused by lack of vitamin B1 in the body. Disturbance of formation of which coenzyme can cause these symptoms?

+Thiamine pyrophosphate

Coenzyme A

FAD

NADP

Pyridoxal phosphate

190. A consumptive patient was prescribed riphampicin that inhibits an enzyme RNA-polymerase at the initiation stage of the process of:

+Transcription

Translation

Replication

Reparation

Amplification

191. One codon from 64 triplets that code amino acids is an initiation codon which codes the amino acid methionine. Point this triplet:

+АUG

UCG

GGU

GАC

CАU

192. DNA-polymerase creates the Okazaki fragments on the “replication fork” lagging strand. Point enzyme that joins these fragments into one chain:

+DNA-ligase

Primase

Exonuclease

RNA-polymerase

DNA-polymerase

193. AIDS virus RNA penetrated inside the leucocyte and with the help of revertase (reverse transcriptase) causes a virus DNA synthesis in the cell. The base of this process is:

+Reverse transcription

Operon repression

Operon depression

Reverse translation

Convariant replication

194. A 58-year-old man underwent the operation for removal of prostate (gland) cancer. In 3 months he took the course of a radial and chemotherapy. 5- Fluorodeoxyuridine (thymidylate synthase inhibitor) was included to the medical preparation complex. Synthesis of what compound was blocked by this preparation?

+DNA

tRNA

rRNA

iRNA

Protein

195. A large group of antibiotics, which are used in medicine, inhibits a nucleic acid and protein synthesis. What specific process or reaction from the following is inhibited by erythromycin?

+Ribosome translocation on mRNA in prokaryotes and eukaryotes

Transcription initiation in prokaryotes

Peptidiltransferase reaction of the translation in prokaryotes

Aminoacyl-tRNA binding to the ribosome A site in prokaryotes

Transcription in prokaryotes & eukaryotes

196. In genetic engineering the way of synthesis of different genes from a RNA matrix chain to DNA is carried out with the help of the following enzyme (this enzyme catalyzes the process found in RNA-containing viruses):

+Revertase

DNA- ligase

Helicase

Exonuclease

Endonuclease

197. Protein synthesis in prokaryotes takes place on ribosomes after the amino acid activation and their transportation to ribosomes with the help of t-RNAs. What amino acid is the first in the biosynthesis?

+Formylmethionine

Valine

Serine

Glycine

Cysteine

198. Delay of malignant tumor cell division occurs under the influence of preparations that block the dTMP synthesis, inhibiting thymidylate synthase. Choose a compound which can have such influence.

+5-Fluorouracyl

Thymine

Hypoxanthine

Dihydroorotic acid

Adenylosuccinate

199. Under ocassional usage of mushrooms (death-cup), which contain a venom – α-amanitin, poisoning of the human organism occurs. Point, what enzyme is inhibited by this venom?

+RNA polymerase II

DNA polymerase

DNA synthetase

Peptidyl transferase

Translocase

200. A newly synthesized organic compound specifically oppresses the reverse transcriptase activity. What pharmacological action is most probable to this compound?

+Antiviral

Antimicrobial

Antitumoral

Immunosuppressive

Radioprotectoral

201. Mechanism of antivirus and antineoplastic action of interferons is connected with the influence on the process of:

+Initiation of protein biosynthesis

Elongation of protein biosynthesis

Termination of protein biosynthesis

DNA biosynthesis

RNA biosynthesis

202. DNA polymerases that take part in DNA replication are not capable to start synthesis of a new strand of DNA without RNA-primer. What enzyme is needed for its (primer) synthesis?

+Primase

DNA-ligase

Helicase

DNA-polymerase I

Gyrase

203. Detoxification of heavy metals on molecular level in the human organism is the consequence of:

+Metallothionein gene amplification

Microsomal oxidation

Formation of a complex with the active form of glucuronic acid

Formation of a complex with the active form of sulfuric acid

Interactions with hepatocuprein

204. In diagnostics of HIV-infection a method of polymerase chain reaction (PCR) is used. What is the PCR method based on?

+Gene amplification

Gene recombination

Translation

Transcription

Genome cutting

205. Enzyme preparations are used in medical practice for treatment of festering wounds. What enzyme from the listed below is used in these cases?

+Trypsin

Acid phosphatase

Alkaline phosphatase

Amylase

Arginase

206. Enzymes catalyze proceeding of biochemical processes in the organism. What is the optimal temperature for their action?

+37 0С –40 0С

0 0С –4 0С

28 0С –30 0С

2 0С-4 0С

18 0С –20 0С

207. Acetylcholinesterase inhibition occurs under usage of proserin, which is the pharmaceutical preparation. Point the type of inhibition:

+Competitive

Uncompetitive

Noncompetitive

Allosteric

Reversible

208. Immobilized on bandage material trypsin preparations are used for purification of festering wounds and their fast cicatrization. What is their advantage over a free enzyme?

+Longer period of action

Stronger activity

Higher specificity of action

Higher sensitivity to temperature

Higher sensitivity to pH changes

209. Increasing of the LDH1, LDH2, AST, and creatine phosphokinase (MB isozyme) activity was determined in the patient`s blood. Diagnose, what organ the abnormalities of biochemical processes are taking place in?

+Heart

Skeletal muscles

Kidneys

Liver

Pancreas

210. A patient with myocardial infarction was prescribed the fibrinolytic preparation “Streptodecase” that was made of a water-soluble matrix of polysaccharide nature using the method of:

+Enzyme immobilization

Autolysis

Ultracentrifugation

Electrophoresis

Extraction

211. Preparation armine from a group of POC (organophosphorous compounds) that has a strong anticholinesterase activity was used as antiglaucomic substance during last years. Point the type of acetylcholinesterase inhibition:

+Noncompetitive

Uncompetitive

Allosteric

Substrate

Competitive

212. Dehydrogenases are enzymes that split hydrogen atoms off a substrate. What class of enzymes does lactate dehydrogenase belong to?

+Oxidoreductases

Transferases

Lyases

Hydrolases

Isomerases

213. Enzyme lipase splits ester bonds in triacylglycerol molecules. What class this enzyme belongs to?

+Hydrolases

Transferases

Isomerases

Oxidoreductases

Ligases

214. Sulfanilamides are widely used as bacteriostatic substances. The mechanism of antimicrobial action of sulfanilamide preparations is based on the structural similarity with:

+Para-aminobenzoic acid

Glutamic acid

Folic acid

Nucleic acid

Antibiotics

215. Acute pancreatitis was diagnosed in a patient. Determination of what from the listed below blood enzymes could be a diagnostic criterion?

+Amylase

Aldolase

LDH

Creatine kinase

Alanine amino peptidase

216. Leading majority of cell enzymes has the maximum of activity in the range of pH 6-8. But there is an enzyme which optimum lies in the interval of pH 9.5 -10. This enzyme is:

+Arginase

Pepsin

Trypsin

Papain

Urease

217. The enzyme urease is able to destroy the structure of urea only. The type of its specificity is:

+Absolute

Stereo-chemical

Absolute group

Relative group

Classic

218. A burn scar has left in a patient. For its resolution an electrophoresis with enzyme has been appointed to the patient. Name the enzyme.

+Hyaluronidase

Arginase

Asparaginase

ATP-synthase

Glycine oxidase

219. Vasopressin - a hormone which expresses a powerful antidiuretic action, stimulating a return current of water through the membranes of renal tubules. What is its chemical nature?

+Peptide

Carbohydrate

Amino acid derivative

Steroid

Lipid

220. Injection of adrenalin to the organism results in the increase of glucose level in the blood. What process is mainly activated in this case?

+Glycogen degradation

Alcoholic fermentation

Pentose phosphate pathway

Citric acid cycle

Glycogen synthesis

221. A patient was prescribed a steroid anabolic medicine. What hormones synthetic analogues have been found an application in medicine as preparations with anabolic action?

+Androgens

Mineralocorticoids

Gestagens

Clucocorticoids

Estrogens

222. Cyclic nucleotides (cAMP and cGMP) are second messengers in the transfer of information. What is the way of their regulatory function?

+Specific protein kinase activation

Histone phosphorylation

Neurotransmitter activation

CNS stimulation

Transcription and translation stimulation

223. A patient without consciousness was delivered to reanimation. Marked smell of acetone from the mouth, acute hyperglycemia and ketonemia were observed. Which complications of diabetes mellitus took place in that case?

+Diabetic coma

Hypoglycemic coma

Cataract

Acetone acute poisoning

Nephrite

224. What endocrine gland hormones express influence on energy metabolism due to increasing of oxidative phosphorylation rate in the mitochondria that is accompanied by increased oxygen consumption by the organism and calorigenic effect?

+Thyroid gland

Pancreatic gland

Parathyroid gland

Adenohypophisis

Adrenal medullary gland

225. At insufficient consumption of carbohydrates with food the need in them for organism is compensated due to gluconeogenesis. Which of the listed hormones express a stimulating influence on gluconeogenesis?

+Glucocorticoids

Mineralocorticoids

Insulin

Calcitonin

Vasopressin

226. Adrenal cortex glands produce some hormones revealing an anti-inflammatory effect. Point the main hormone which is carrying out this function?

+Hydrocortisone

Aldosterone

Testosterone

Estrone

Progesterone

227. Cholecalcipherol (vitamin D3) in the liver and kidneys is activated and converted to the active form – 1,25-dihydroxycholecalcipherol. Name a hormone which regulates this process.

Insulin

+Parathyroid hormone

Aldosterone

Calcitonin

Adrenocorticotrophic hormone

228. Sulfanilurea derivatives (e.g. butamide) are commonly used at non-insulin dependent diabetes treatment. What is a biochemical mechanism of their hypoglycemic action?

+Strengthening of the insulin hypoglycemic action

Reduction of the glucocorticoid hypoglycemic action

Reduction of the insulin hypoglycemic action

Strengthening of the glucocorticoid hyperglycemic action

Reveal a diuretic action

229. Non-steroid anti-inflammatory remedies, e.g. aspirin, inhibit cyclooxygenase which converts arachidonic acid into:

+Prostaglandins

Leukotrienes

Biogenic amines

Endorphins

Catecholamines

230. Amino acid tyrosine is a predecessor of some hormones. Point one of them, produced in the adrenal medulla glands.

+Adrenaline

Histamine

Gastrine

Serotonin

Glucagon

231. Tyrosine is used for the thyroxine synthesis. What atoms from microelements take part in this process?

+I

Fe

Cu

Ca

Zn

232. In therapy of chronic inflammation processes a series of medical preparations is used. Point out, which of the preparations reversibly inhibits cyclooxygenase (COX) of arachidonic acid.

Carnitine

Antimycin

Vikasol

+Indomethacin

Cholecalcipherol

233. Cyclooxygenase activity may be inhibited by use of some medicines. Which of them irreversibly inhibits this enzyme?

Allopurinol

Insulin

Oligomycin

+Aspirin

Aminalon

234. In a patient with Itsenko-Cushing’s syndrome a steady hyperglycemia and glucosuria are observed. What hormone synthesis and secretion are increased in this case?

+Cortisol

Epinephrine

Glucagon

Thyroxine

Aldosterone

235. Under emotional stress triglyceride lipase is activated in adipocytes. Point out, concentration of what second messenger increases at that situation.

cGMP

Diacylglycerol

+cAMP

AMP

Ca2+

236. Name a hormone-synchronizer of biogenic rhythms in the organism which is the derivative of an amino acid:

+Melatonin

Adrenalin

Dopamine

Noradrenalin

Thyroxine

237. A patient with the signs of feminization (eunuchoidism) was prescribed the most active male sex hormone. Point it.

+Dihydrotestosterone

Testosterone

Progesterone

Androsterone

Pregnenolone

238. A gynecologist used a neurohypophysis hormone for the stimulation of child birth activity. Name it.

+Oxytocin

Vasopressin

Intermedin

Chorionic gonadotropin

Serum gonadotropin

239. To initiate analgesia a peptide that reveals the morphine effect, but is synthesized in the CNS may be used. Name it.

+β-Endorphine

Oxytocin

Somatoliberin

Vasopressin

Calcitonin

240. Renin is an enzyme which is produced by the juxtaglomerular cells of kidneys in response to blood pressure lowering. Its action is directed to:

+Angiotensinogen – a protein, which is secreted by the liver

Natriuretic hormone, which is synthesized in atrium and brain

Decrease of arachidonic acid availability for synthesis of prostaglandins and leukotrienes

Stimulation of glucose transport into cells

Smooth muscle relaxation, artery and arteriole wall widening

241. Atriopeptin, aurikulin, cardionatrin – the peptides which possess a diuretic effect that exceeds by 20 times the action of the pharmacological preparation furosemide. What hormone synthetic analogues are they?

+Atrium natriuretic factor

Antidiuretic hormone

Insulin

Somatostatin

Aldosterone

242. Hormones are divided into 2 groups in connection with cellular localization of receptor. Which hormone influences directly on the nucleus initiating physiological effects?

+Estradiol

Growth hormone

Insulin

Dopamine

Calcitonin

243. A 21-year-old sportsman has been taking anabolic steroids in for three months. How it may affect total protein concentration in the blood serum?

+Total protein concentration will rise

Total protein concentration will lower

Will not affect

Immunoglobulin concentration will rise

Cholesterol concentration will lower

244. Parents noticed that their 6-year-old boy lagged behind in physical and psychic development. The boy became inattentive, indifferent, incapable to memorize simple educational actions. A doctor suspected in the child’s organism a lack of:

+Iodine

Somatotropin

Vitamin B1

Ferrum

Calcium

245. Research of urine composition found a decrease of sodium ions concentration. Which of hormones provides strengthening of sodium reabsorption in the convoluted tubules of the nephron?

+Aldosterone

Acetylcholine

Somatostatin

Adrenaline

Vasopressin

246. A number of enzymes takes part in the ATP synthesis in the cell. Enzymes of the electron transport chain, which provide ATP synthesis, are localized in:

+Mitochondrion

Lysosome

Nucleus

Peroxisome

Ribosome

247. Under intoxication by carbon monooxide the tissue respiration in man is inhibited. Name the enzyme of the respiratory chain, which activity is sharply lowering at such conditions.

+Cytochrome oxidase

Succinate dehydrogenase

NADH - dehydrogenase

ATP-synthase

Cоenzyme Q

248. Antibiotic antimycine A blocks electron transport by the electron transport chain. Mark what point does it affect on?

+Between cytochromes b and c1

Between FADH2 and CоQ

Between cytochromes с1 and с

Between nucleotides NADH and FADH2

Between CоQ and cytochrome b

249. The biggest part of biochemical processes in the human organism is closely related with the use of energy. What compound is the unique accumulator, donor, and transformer of the energy in the organism?

+Adenosine triphosphate

Phosphoenolpyruvate

Creatinephosphate

Acetyl -КоА

Succinyl-CоА

250. Under some compound's action the blocking of oxidative phosphorylation occurs in the mitochondria, however oxygen consumption takes place and substrates are being oxidized. Point compound that uncouples those processes.

+Thyroxine

Adrenalin

Progesterone

Oestradiol

Somatostatin

251. Status of the patient's antioxidant system was estimated on basis of determination of one endogenous antioxidant content. What namely?

+Alpha-tocopherol

Trivalent ferrum

Ornithine

Hydrogen peroxide

Cholecalcipherol

252. In a patient with stomatitis and necrotic alterations in the oral cavity an inborn catalase deficiency (acatalasia) was revealed. This enzyme (catalase) catalyzes the reaction:

+Cleavage of H2O2 to H2O and O2

Cleavage of H2O2 to H2O and O

Synthesis of H2O2

Synthesis of ATP

Decarboxylation of α-ketoacids

253. Inherited genetic defects lead to the abnormalities in synthesis of some enzymes in the human organism. Point the enzyme which defect leads to derangements in lactose hydrolysis:

+Lactase

Saccharase

Maltase

Amylase

Peptidase

254. A newborn has diarrhea, vomit, and since some time lenticular opacity (cataract) is developed. This disease is connected with the abnormalities in the synthesis of the enzyme:

+Galactose 1-phosphate uridyl transferase

Hexokinase

Glucose 6-phosphatase

Glycogen synthetase

Glucose phosphate isomerase

255. Influence of some hormones on carbohydrate metabolism express in stimulation of the glycogen degradation. What enzyme catalyzes the first step of the glycogen degradation with glucose 1-phosphate formation?

+Glycogen phosphorylase

Glycogen synthetase

Phosphofructokinase

Aldolase

Pyruvate kinase

256. The order and localization in the cell of the glycolysis fermentative reactions are determined at present time. Point this localization.

+Cytosol

Mitochondria

Golgi apparatus

Lysosomes

Nucleus

257. It is known that some carbohydrates are not digested in the GIT of the human organism. Choose such carbohydrate.

+Cellulose

Sucrose

Lactose

Starch

Glycogen

258. A sportsman finished the training. What process activation gives the result in increasing of lactate in the blood?

+Glycolysis

Gluconeogenesis

Tricarboxylic acid cycle

Glycogen synthesis

Pentose-phosphate pathway

259.The main source of energy for erythrocytes is glycolysis. What is the energy output of glycolysis?

+2 ATP molecules

7 ATP molecules

5 ATP molecules

3 ATP molecules

4 ATP molecules

260. In a 22-year-old woman after aspirin treatment the signs of hemolytic anemia were observed. It was due to hereditary deficiency of the pentose phosphate pathway enzyme – glucose-6-phosphate dehydrogenase which supplies the organism with:

+NADPH

FMN

NAD+

FAD

ATP+НАДФН

261. In sportsmen in some time after physical activity the process of gluconeogenesis is activated. Point the substrate which is used for this process.

+Lactate

Serine

α-Ketoglutarate

Aspartic acid

Glutamic acid

262. The second event of aerobic degradation of glucose in the cell is the oxidative decarboxylation of pyruvate. Point the main product of this process.

+Acetyl-CoA

Oxaloacetate

Citrate

Pyruvate

Succinate

263. A suffer from diabetes mellitus got a high dose of insulin. It caused giddiness, loss of consciousness and spasms. What glucose blood level can be observed under these conditions?

+2,3 mmol/L

3,5 mmol/L

6,5 mmol/L

8,0 mmol/L

12,5 mmol/L

264. Hyperglycemic coma has been diagnosed in a patient. What is a blood glucose level possible for these conditions?

+18,0 mmol/L

3,0 mmol/L

9,0 mmol/L

5,3 mmol/L

7,5 mmol/L

265. Point a localization of the process of pyruvate oxidative decarboxylation in the cell.

+Mitochondria

Cytoplasm

Nucleus

Ribosome

Endoplasmatic reticulum

266. A 5-year-old boy is diagnosed cataract, fat degeneration of the liver. Biochemical analysis revealed the increase of blood galactose level and decrease of blood glucose level. What metabolic disorder takes place in the patient?

+Galactosemia

Fructosemia

Glycogen storage disease

Diabetes mellitus

Porphyria

267. At aerobic conditions pyruvate is oxidized, with loss of its carboxyl group by the pyruvate dehydrogenase complex, located in the mitochondria of eukaryotic cells. Point one coenzyme, which is part of this complex:

+FAD

FMN

Pyridoxal phosphate

Metyl-cobalamine

N-carboxybiotine

268. In a 5-year-old child with an increased body temperature after aspirin treatment an intensive erythrocyte haemolysis was observed. What enzyme inherited defficiency could cause hemolytic anemia in the child?

+Glucose-6-phosphate dehydrogenase

Glucose-6-phosphatase

Glycogen phosphorylase

Glucokinase

Gamma-glutamyl transferase

269. In a 40-year-old patient with schizophrenia normal levels of glucose, ketone bodies and urea in the blood were observed. Shock therapy by regular insulin injections led to an insulin coma development. After that a psychic state of the patient became better. What was the most probable reason for the insulin coma?

+Hypoglycemia

Hyperglycemia

Tissue dehydratation

Metabolic acidosis

Glucosuria

270. In a man after use of honey on empty stomach hypoglycemia has developed. What inherited disease this may specify of?

+Fructose intolerance

Diabetes mellitus

Galactosemia

Glycogen storage disease

Milk intolerance

271. One of the stages of aerobic oxidation of glucose is the oxidative decarboxylation of pyruvate. What vitamins take part in this process?

+PP, B1, B2, pantothenic acid

A, D, C

H, K, P

Bc, B12, B6

B5, Bc, B12

272. In a patient who suffers from enterocolitis diarrhea, cramps, flatulence have appeared after milk intake. What enzyme deficiency these abnormalities are connected with?

+Lactase

Maltase

Saccharase

Amylase

Glycogen synthase

273. Avidin – a hen egg protein - is a mighty specific inhibitor of the vitamin H-containing enzymes. What conversion from the listed below will be blocked after avidin introduction?

+Pyruvate-oxaloacetate

Glucose-pyruvate

Pyruvate-Glucose

Oxaloacetate-Glucose

Glucose-Ribose-5-phosphate

274.Cleavage of starch and glycogen starts in the oral cavity due to the action of amylase that is excreted by salivary glands. What bonds are hydrolyzed by the enzyme in question?

+α- 1,4-glycosidic

α- 1,6-glycosidic

β- 1,4-glycosidic

β- 1,2-glycosidic

α- 1,3-glycosidic

275. Red blood cells use for their life energy in the form of ATP. Specify the metabolic process that provides erythrocytes the necessary quantity of ATP.

+Anaerobic glycolysis

Gluconeogenesis

pentose phosphate cycle

Beta-oxidation of fatty acids

Citric acid cycle

276. The main mechanism of ammonia utilization in the organism is the urea biosynthesis. What high-energy compound formation in the urea synthesis the cycle begins from?

+Carbamoyl phosphate

Citrulline

Arginine

Fumaric acid

Argininosuccinate

277. Irritability of the nervous system, which can be observed under a B6 hypovitaminosis, is connected with the lack of synthesis of a biogenic amine that has an inhibitory effect on the CNS. Name this biogenic amine.

+Gamma-aminobutyric acid

Histamine

Dopamine

Tryptamine

Serotonin

278. A patient has liver function abnormalities. What biochemical index is necessary to measure in the blood to determine the liver state?

+ALT

Creatine phosphokinase

Aldolase

LDH1

Lipase

279. Ammonia is generated in different tissues and organs and neutralized in the liver by converting into urea. What amino acid transports it from the skeletal muscles to liver?

+Alanine

Histidine

Glycine

Serine

Aspartate

280. Ammonia is a toxic compound and its increasing in the blood is especially dangerous for neurons. What amino acid from the listed below is used as effective remedy that binds ammonia in the brain?

+Glutamic

Succinic

Benzoic

Hippuric

Sulfosalicylic

281. Aminotransferases are the enzymes which transfer amino groups from one compound to another. Point the acceptor of amino groups.

+α-Ketoglutaric acid

Lactic acid

Succinate

Acetone

Butyric acid

282. Pancreatic enzymes are transported to the duodenum in inactive state. Point the enzyme that activates trypsinogen.

+Enterokinase

Gastricsin

Lipase

Pepsin

Elastase

283. Aminotransferases transfer an amino group from one compound to another. Now more than 50 aminotransferases are known. Point the substance that is a prosthetic group of these enzymes.

+В6

В1

В5

В12

РР

284. In a patient the amino acid transport in the intestine cells is decreased. What substance participates in the amino acid transport?

+Glutathione

Antiserine

Amylase

Ornithine

Alanine

285. Point the normal values of gastric juice pH.

+1,5-2,5

4,0-5,0

6,8-7,2

1,0-5,0

2,0-4,0

286. At alkaptonuria an excessive excretion of homogentisate with the urine takes place. What amino acid metabolism the abnormality of this pathology appearance is connected with?

+Tyrosine

Phenylalanine

Alanine

Methionine

Asparagine

287. Pigment melanin synthesis doesn’t occur at albinism. Abnormalities that cause this disease are connected with metabolism of the amino acid:

+Phenylalanine

Asparagine

Alanine

Methionine

Glutamine

288. Mother of a 2-year-old boy told a doctor of a very unusual smell of urine which resembled the maple syrup smell. After carrying the analyses out the diagnosis was made. Ketoaciduria of branched acids. Which are these amino acids?

+Leucine, valine, isoleucine

Tyrosine, tryptophan

Arginine, histidine

Proline, serine, glycine

Phenylalanine, tyrosine

289. A 23-year-old man was diagnosed muscular dystrophy and recommended to use for intensification of the pyrimidine synthesis…

+Potassium orotate

Ascorbic acid

Lipoic acid

Cocarboxylase

Cyanocobalamin

290. As a result of abnormality of nucleic acid metabolism the precipitation of some salts in tissues, especially in the joints takes place. That can provoke certain diseases. Point the substance that forms the salts.

+Uric acid

Glyoxylate

Urea

Allantoin

Lactic acid

291. A 27-year-old patient went to a doctor with symptoms of jaundice, high temperature and general weakness. It was diagnosed acute viral hepatitis. Which of biochemical indices is prevalent in the peak of jaundice?

+Conjugated bilirubin

Stercobilin

Non-conjugated bilirubin

Verdoglobin

Biliverdin

292. In a patient the increasing of a conjugated bilirubin level in the blood serum was observed, the faeces were light-grey; the urine had a colour of beer. The skin and mucous tunics were yellow. What type of jaundice took place in this case?

+Biliary obstruction

Hepatic jaundice

Physiologic jaundice

Jilber’s disease

Hemolytic jaundice

293. To a patient who was diagnosed with viral conjunctivitis a doctor prescribed eye drops which contained:

+DNA-ase

RNA-ase

Trypsin

Penicillin

Streptocid

294. One of the main pathogenetic ways of radiation sickness genesis is a free radical process intensification. What substances are the primary source of free radicals?

+Lipids

Carbohydrates

Proteins

Water

Metal ions

295. For improving sports results a sportsman was recommended to use carnitine. What process is activated by carnitine?

+Transport of fatty acids

Transport of glucose

Transport of vitamine К

Transport of calcium ions

Transport of amino acids

296. During one cycle of the beta-oxidation in mitochondria 1 FADH2 and 1 NADH(H+) are produced. They pass atoms of hydrogen to the electron transport chain, where in the oxidative phosphorylation are produced:

+5 АTP

10 АТP

8 АТP

15 АТP

3 АТP

297. Level of cholesterol in the blood of a patient who has diabetes mellitus is 12 mmol/L. Point a possible complication:

+Atherosclerosis

Rickets

Dermatitis

Paralyses

Diarrhea

298. The intracellular metabolism of glycerol begins from its activation. What compound is synthesized in the first reaction of its transformation?

+α-Glycerolphosphate

Pyruvate

Choline

Lactate

Acetyl-CoА

299. In a 12-year-old child type I hyperlipoproteinemia was diagnosed and characterized by a high content of chylomicrons in the blood plasma. The high concentration of chylomicrons was a consequence of the lack of:

+Lipoprotein lipase

Triacylglycerol lipase

Carnitine acyl transferase

Cholesterol esterase

Phosphokinase

300. Point the end product of β-oxidation of fatty acids with odd number of carbonic atoms.

+Propionyl-CoA

Succinyl-CoA

Acetyl-CoA

Acetoacetyl-CoA

Hydroxymethylglutaryl-CoA

301. During fasting ketoacidosis is developing. Increased concentration of which metabolite in blood is a symptom of this condition?

+Acetoacetate

Oksaloacetate

Malonate

Acetyl-CoA

Beta-hydroxy-beta-methylglutaryl-CoA

302. A process of conjugation in phase II of toxic compound neutralization is fulfilled by means of joining of certain chemical compounds to their functional groups. Choose one of such compounds:

+Glucuronic acid

Higher fatty acids

Cholesterol

Glucose

Pyruvate

303. Choose the right definition to the term “xenobiotics”:

+Alien substances that enter the human organism and aren’t used in it

Low molecular weight organic substances that interact with enzyme and modulate its activity

Protein catalysts that accelerate reactions in the cell

Allosteric effectors

Substances that regulate metabolism and development of the organism

304. Cleavage of acetylsalicylic acid (aspirin) in the human organism to salicylic and acetic acids is by type a reaction of:

+Hydrolysis

Isomerization

Conjugation

Reduction

Oxidation