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

a. Protein kinase
b. Adenylate cyclase
c. Lipoprotein lipase
d. Phospholipase C
e. Prostaglandin synthetase

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

a. Indometacin
b. Allopurinol
c. Aspirin
d. Sodium diclophenac
e. Proserin

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

a. Metalloproteins
b. Glycoproteins
c. Ketone bodies
d. Purine nucleotides
e. Lipoproteins

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

a. Tocopherol
b. Ergocalciferol
c. Retinol
d. Pyridoxine
e. Cobalamin

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

a. Vitamin B12
b. Nicotinic acid
c. Vitamin D
d. Vitamin K
e. Folic acid

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

a. Serine
b. Glycine
c. Cysteine
d. Alanine
e. Methionine

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

a. ATP synthesis
b. Amino acid synthesis
c. Glucose synthesis
d. Lipide synthesis
e. Glycogen synthesis

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

a. Peptide
b. Hydrogen
c. Glycosidic
d. Amide
e. Phosphodiester

9. Active form of one of the sulphur-containing amino acids can be used as a methyl group donor for the drug methylation. Specify this amino acid:
a. Glutamine
b. Glycin
c. Methionine
d. Tyrosine
e. Glutamate

10. Protein digestion in the stomach is carried out by pepsin secreted in form of an inactive pepsinogen. Pepsinogen is converted to pepsin by the removal of the N-terminal peptide that is provoked by:
a. Acetic acid
b. Sulfuric acid
c. Perchloric acid
d. Bile acids
e. Amino acids

11. Enzyme hyaluronidase breaks down hyaluronic acid thus increasing intercellular permeability. Which vitamin strengthens vascular walls and inhibits activity of hyaluronidase?
a. A
b. B2
c. D
d. P
e. B1

12. High-grade deficit of the ascorbic acid causes development of scorbutus. This pathology develops due to the disturbed synthesis of the following connective tissue protein:
a. Ceruloplasmin
b. Collagen
c. Fibrinogen
d. Prothrombin
e. Albumin

13. Cardiac diseases are treated with cocarboxylase preparation. This preparation is the coenzymatic form of the following vitamin:
a. B12
b. B6
c. B1
d. C
e. P

14. A patient underwent an operation. After it he was prescribed glycosaminoglycan that has coagulating action. Specify this substance:
a. Chondroitin-4-sulfate
b. Heparin
c. Hyaluronic acid
d. Keratan sulfate
e. Chondroitin-6-sulfate

15. Depressive states can be treated by means of drugs inhibiting the enzyme that inactivates biogenic amines. Specify this enzyme:
a. LDH (lactate dehydrogenase)

b. AST (aspartate aminotransferase)
c. ALT (alanine aminotransferase)
d. MAO (monoamine oxidase)
e. CPK (creatine phosphokinase)

16. During starvation the normal rate of glucose in blood is sustained due to the gluconeogenesis stimulation. Which of the following substances can be used as a source for glucose synthesis?
a. Ammonia
b. Adenine
c. Alanine
d. Nicotinamide
e. Urea

17. Oxidative deamination of biogenic amines in the tissues is catalyzed by the following enzyme:
a. Acetylcholinesterase
b. Monoaminooxidase
c. Alanine transaminase
d. Aspartate transaminase
e. Decarboxylase

18. Analysis of a patient's urine revealed increased concentration of the uric acid. The patient was prescribed allopurinol. What is the biochemical mechanism of its action?
a. Desaminase inhibition
b. Cyclooxigenase activation
c. Xanthine oxidase inhibition
d. Phosphorylase inhibition
e. Nucleosidase inhibition

19. Blood serum electrophoresis revealed interferon. This protein is in the following fraction:
a. γ-globulins
b. α2-globulins
c. Albumins
d. β-globulins
e. α1-globulins

20. After examination a patient has been diagnosed with alkaptonuria. This pathology is caused by the deficit of the following enzyme:
a. Homogentisic acid oxidase
b. Acetylcholinesterase
c. Monoamine oxidase
d. Thyroxin hydroxylase
e. Diamine oxidase

21. It is known that the unconjugated bilirubin being the product of heme catabolism is detoxicated in liver. Which compound is involved into the bilirubin detoxication within the hepatocytes?
a. Urea
b. Lactic acid
c. Glycin
d. Glucuronic acid
e. Mevalonic acid

22. Gluconeogenesis plays an important part in maintaining normal glucose rate in blood during starvation. Name the main substrate of this process:
a. Bile acids
b. Acetone
c. Cholesterol
d. Nucleic acids
e. Amino acids

23. Interaction of catecholamines with beta-adrenoreceptors increases the level of cyclic adenosine monophosphate in tissue cells. Name an enzyme that catalyzes reaction of cyclic adenosine monophosphate generation:

a. Phosphodiesterase
b. Guanylate cyclase
c. Creatine kinase
d. Adenylate cyclase
e. Phosphatase

24. Antivitamins are substances of various structure that limit utilization of vitamins in an organism and have an opposite to them action. Name antivitamin of vitamin K:

a. Deoxypyridoxine
b. Sulfapyridasine
c. Dicumarol
d. Aminopterin
e. Isoniazid

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

a. Malonyl-CoA
b. Acetyl-CoA
c. Cholesterol
d. Levulinic acid
e. Tyrosine

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

a. B12
b. B1
c. C
d. B2
e. B6

27. Biochemical function of water-soluble vitamins depends on their ability to turn into the coenzymatic forms. Specify the coenzymatic form of the vitamin B2 (riboflavin):

a. PALP (pyridoxal phosphate)
b. FMN (flavin mononucleotide)
c. TMP (thiamine monophosphate)
d. NAD+ (nicotinamide adenine dinucleotide)
e. TDP (thiamine diphosphate)

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

a. Lipids
b. Nucleic acids
c. Disaccharides
d. Proteins
e. Polysaccharides

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

a. Gilberts disease
b. Obstructive
c. Neonatal jaundice
d. Parenchymatous
e. Hemolytic

30. A patient complains of pain behind the breastbone on the left, perspiration and palpitation. Which of the following enzymes should be found in blood in order to confirm the diagnosis of myocardium infarction?

a. alpha-fetoprotein, aldolase, CPK
b. AspAT, CPK, LDH-1
c. Amylase, alkaline phosphatase, AlAT
d. AlAT, aldolase, LDH-4
e. Acid phosphatase, LDH-5, LDH-4

31. It is known that indirect bilirubin generated as a result of heme disintegration is detoxicated in liver. What organic compound takes part in bilirubin detoxication in hepatocytes?

a. Urea
b. Lactic acid
c. Glycin
d. Uridine diphosphate glucuronic acid
e. Mevalonic acid

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

a. Alanine
b. Glycin
c. Valine
d. Serine
e. Histidine

33. Single-oxygenase system of membranes of endoplasmic hepatocyte reticulum includes flavoprotein NADF-cytochrome, R-450-reductase and R-450-cytochrome. It stimulates inactivation of biologically active substances or neutralization of toxic compounds by catalyzing the reaction of:

a. Acetylation
b. Reduction
c. Oxidation
d. Methylation
e. Hydroxylation

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

a. Nicotinic
b. Lipoic
c. Folic
d. Pantothenic
e. Pangamic

35. Sulfonamides are widely used as bacteriostatic agents. The mechanism of antimicrobial action of sulfonamides is based on their structural similarity to:

a. Glutamic acid
b. Nucleic acid
c. Antibiotics
d. Para-aminobenzoic acid
e. Folic acid

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

a. Protein
b. Fat
c. Nicotinic acid
d. Common salt
e. Tocopherol

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

a. Trypsin
b. Lipase
c. Chymotrypsin
d. Pepsin
e. Amylase

38. 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:

a. Arginase
b. Histidine decarboxylase
c. Hexokinase
d. Tyrosinase
e. Carbonic anhydrase

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

a. Uridine
b. Guanine
c. Alanine
d. Glutamine
e. Adenine

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

a. Glycogenolysis
b. Ketogenesis
c. Glycolysis
d. Gluconeogenesis
e. Oxidation of fatty acids

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

a. Glucose
b. Methionine
c. Bilirubin
d. Cholesterol
e. Glycine

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

a. Nicotinic acid
b. Pyridoxine hydrochloride
c. Thiamine hydrochloride
d. Cyanocobalamin
e. Ascorutinum

43. Decarboxylation of the amino acid histidine results in formation of histamine in the cells. Neutralization of this biogenic amine takes place due to the following enzyme:

a. Aminopeptidase
b. Diaminooxidase (DAO)
c. Catalase
d. Monoaminooxidase (MAO)
e. Aminotransferase

44. Blood analysis revealed rise of activity of LDH1, LDH2, aspartate aminotransferase, kreatine

phosphokinase-MB. Biochemical disorder is observed in the following organ:

a. Kidneys
b. Skeletal muscles
c. Heart
d. Liver
e. Pancreas

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

a. Trypsin, chemotrypsin
b. Amylase, maltase
c. Lipase, phospholipase
d. Pepsin, gastricsin
e. Enterokinase, lipase

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

a. Lactate
b. Succinate
c. Phenylalanine
d. Aspartate
e. Malate

47. For treatment of the psychosis a patient was administered the neuroleptic aminazine. The main way of its biotransformation in the organism is induction of microsomal oxidation. Specify the principal component of this system:

a. CoQ-reductase
b. Cytochrome R-450
c. Cytochrome oxidase
d. Cytochrome C
e. NAD-dehydrogenase

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

a. Prostaglandins
b. Urea
c. Cholesterol
d. Haem
e. Uric acid

49. Some products of amino acid decarboxylation are biologically active substances. What CNS inhibition mediator is formed by decarboxylation of glutamic acid?

a. GABA
b. Histamine
c. Asparagine
d. Cadaverine
e. Putrescine

50. A patient with low immunity, frequent colds is recommended to take ascorutine as a more effective drug than ascorbic acid. What constituent substance of this preparation intensifies action of vitamin C?

a. Vitamin P
b. Glucose
c. Vitamin D
d. Lactose
e. Vitamin A

51. In order to prevent adipose degeneration of liver after the viral hepatitis a patient should be administered lipotropins. Name one of them:

a. Allopurinol
b. Tryptophan
c. Choline
d. Contrykal
e. Vicasol

52. Blood analysis of a patient revealed high content of the following enzymes: creatine kinase (MB-isoform), aspartate aminotransferase and LDH 1,2. What pathology should be suspected in this case?

a. Pancreatitis
b. Myocardium infarction
c. Liver cirrhosis
d. Muscular dystrophy
e. CNS affection

53. Patients joints are enlarged, look like thickened disfigured knots. Blood analysis revealed high concentration of uric acid and its salts. This state is caused by metabolic disorder of the following substances:

a. Phospholipids
b. Purines
c. Porphyrines
d. Pyrimidines
e. Cholesterol

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

a. Fatty acid complexes with albumines
b. Low-density lipoproteins
c. Chylomicrons
d. High-density lipoproteins
e. Globulin complexes with steroid hormones

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

a. Alanine
b. Methionine
c. Phenylalanine
d. Glutargine
e. Asparagine

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

a. Oxalates
b. Cholesterol
c. Haemoglobin
d. Albumine
e. Urates

57. Some proteins in the human organism have buffer properties. Which aminoacid allows hemoglobine to reveal its buffer properties in blood?

a. Isoleucine
b. Alanine
c. Histidine
d. Valine
e. Threonine

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

a. Tyrosine
b. Tryptophan
c. Glutamine
d. Serine
e. Proline

59. Transamination is the biochemical process in which amino groups of different amino acids take form of one of the amino acids. What amino acid is it?

a. Leucine
b. Arginine
c. Glycine
d. Valine
e. Glutamic

60. Aminotransferases are the enzymes that transfer an amino group from one compound to another. What compound is the acceptor of amino groups?

a. Acetone
b. Succinic acid
c. Butyric acid
d. α-ketoglutaric acid
e. Lactic acid

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

a. Inhibits glycolysis
b. Activates lypogenesis
c. Activates alcoholic fermentation
d. Inhibits glycogenolysis
e. Activates glycogenolysis

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

a. Activity of pancreatic lipase
b. Concentration of low-density lipoproteins
c. Concentration of chylomicrons
d. Concentration of high-density lipoproteins
e. LDH5 activity

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

a. Methionine
b. Tryptophane
c. Glutamate
d. Valine
e. Glycin

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

a. Lactate
b. Pyruvate
c. Alpha-glycerolophosphate
d. Choline
e. Acetyl coenzyme A

65. Ions of heavy metals are very toxic. They block SH-groups that are a part of active centre of enzymes. What is the type of their inhibition mechanism?

a. Allosteric
b. Uncompetitive
c. Substrate
d. Noncompetitive
e. Competitive

66. Under anaerobic conditions during glycolysis ATP is synthesized by the way of substrate phosphorylation. This process uses energy of other high-energy compounds. Specify one of such compounds:
a. Glucose
b. Phosphoenol pyruvate
c. Lactate
d. Glucose 6-phosphate
e. Pyruvate

67. Decarboxylation of 5-hydroxytryptophane gives origin to a certain biogenic amine with vasoconstrictive action. What biogenic amine is it?
a. Gamma-aminobutyric acidc
b. Histamine
c. Serotonin
d. Putrescine
e. Cadaverine

68. Examination of a patient revealed reddening of oral mucosa, cracks on the lips and mouth corners, face skin dryness and desquamation, conjunctiva inflammation, vasculature invasion into the cornea. The possible cause of this pathology is the deficit of the following vitamin:
a. C
b. K
c. D
d. B2
e. E

69. A male patient who suffers from chronic intestinal obstruction has intensified putrefaction of proteins in the colon. What toxic substance originates from tryptophane in this case?
a. Indole
b. Lactate
c. Glucose
d. Kreatine
e. Bilirubin

70. A patient has obstruction of the common bile duct. Which of these substances is usually found in urine in such cases?
a. Ketone bodies
b. Creatinine
c. Glucose
d. Bilirubin
e. Uric acid

71. A male patient has pain in the right subcostal area, acholic feces. Decolouration of feces is caused by deficiency of:
a. Stercobilin
b. Bilirubin
c. Skatole
d. Bile acids
e. Hemoglobin

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

a. Glucose
b. Higher fatty acids
c. Purine nucleotides
d. Amino acids
e. Pyrimidine nucleotides

73. An elderly woman complains of twilight vision impairment. Which of the following vitamins should be administered in this case?
a. A
b. E
c. PP
d. D
e. C

74. A patient is 50 years old. Ad a result of continuous improper diet he has developed hypovitaminosis C. Lesion of connective tissue is caused by low activity of the following enzyme:
a. Tryptophane hydroxylase
b. Glutaminase
c. Alanine aminotransferase
d. Pyruvate carboxylase
e. Proline hydroxylase

75. Low rate of vitamin B6 in the dietary intake leads to disturbance of protein metabolism. What biochemical processes in the patients organism will become less active?
a. Methylation
b. Hydrolysis
c. Reduction-oxidation
d. Phosphorilation
e. Transamination

76. Systematic and intensive physical exercise causes reduction of fat concentration in the adipose tissues. It is released from the cells into the blood in form of:
a. Chylomicrons
b. Ketone bodies
c. Glucose
d. Free fatty acids and glycerine
e. Lipoproteins

77. Dehydregenases are enzymes that detach hydrogen atoms from the substrate. What enzyme class is lactate dehydrogenase related to?
a. Isomerases
b. Lipases
c. Transferases
d. Hydrolases
e. Oxidoreductases

78. A woman in labour was given a preparation that activates contractions of smooth uterine muscles. What hormone is contained in this preparation?
a. Angiotensin
b. Bradykinin
c. Gastrin
d. Secretin
e. Oxytocin

79. Patients ill with tuberculosis take a drug that is an antivitamin of nicotinic acid. Name this substance:
a. Oxythiamine
b. Isoniazid

c. Acrichine
d. Sulfanilamide
e. Isoriboflavin

80. Bile contains of bile acids. choose one of them:
a. Arachidonic
b. Pyruvic acid
c. Glutamine
d. Lactic
e. Cholic

81. The pancreas secretes an enzyme that is able to hydrolyze α-1,4-glycosidic linkages in a glycogen molecule. Specify this enzyme:
a. α-amylase
b. Enterokynase
c. Lysozyme
d. Chemotrypsin
e. Phosphatase

82. It is known that some chemical compounds uncouple the tissue respiration and oxidative phosphorylation. Name one of these compounds:
a. Carbon monoxide
b. Lactic acid
c. Acetyl-CoA
d. 2,4-dinitrophenol
e. Antimycin A

83. Transport form of lipids in blood are lipoproteins. Cholesterol is transported to the liver mostly in form of:
a. Interferons
b. Albumins
c. Low-density lipoproteins
d. Very-low-density lipoproteins
e. High-density lipoproteins

84. Nonsteroid anti-inflammatory drugs are used in medical practice for treating the rheumatoid arthritis, osteoporosis, inflammatory dseases of the connective tissue. These preparations inhibit the activity of the following enzyme:
a. Cyclooxygenase
b. Succinate dehydrogenase
c. Xanthine oxidase
d. Aminotransferase
e. Hexokinase

85. 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?
a. Disulfide
b. Amide
c. Peptide
d. Glycosidic
e. 3,5-phosphodiester

86. 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:
a. Citrate synthase
b. Aspartate aminotransferase
c. Glutaminase
d. Succinate dehydrogenase

e. Asparaginase

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:

a. Asparaginase
b. Succinate dehydrogenase
c. Aspartate aminotransferase
d. Citrate synthetase
e. Glutaminase

88. 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:

a. Dihydrofolate reductase
b. Hexokinase
c. Lactate dehydrogenase
d. Creatine kinase
e. Xanthine oxidase

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

a. Enkephalins
b. Leukotrienes
c. Kinins
d. Iodothyronines
e. Endorphins

90. Addisons (bronze) disease is treated with glucocorticoids. Their effect is provided by the potentiation of the following process:

a. Glycogenolysis
b. Ornithine cycle
c. Glycolysis
d. Pentose phosphate cycle
e. Gluconeogenesis

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

a. Gluconeogenesis
b. Breakdown of proteins
c. Breakdown of lipids
d. Synthesis of glycogen
e. Breakdown of glycogen

92. 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:

a. Thiamin
b. Pantothenic acid
c. Lipoic acid
d. Biotin
e. Folic acid

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

a. Muscles
b. Heart
c. Kidneys
d. Liver
e. Stomach

94. A male patient was found to have hypovitaminosis PP. What amino acid taken with food may

partially compensate the vitamin PP deficiency?

a. Tryptophan

b. Valine

c. Methionine

d. Arginine

e. Phenylalanine

95. 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:

a. Tryptophan

b. Methionine

c. Asparagine

d. Tyrosine

e. Alanine

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

a. Inhibition of acetylcholinesterase

b. Inhibition of monoamine oxidase

c. Inhibition of xanthine oxidase

d. Activation of monoamine oxidase

e. Activation of acetylcholinesterase

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

a. Cholesterol biosynthesis

b. Glycerol oxidation

c. Lipid transport in blood

d. Fatty acid biosynthesis

e. Lipid absorption

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

a. Lipolysis

b. Glycogen synthesis

c. Pentose phosphate pathway

d. Protein phosphorylation

e. Glycolysis

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

a. Prostaglandin synthetase

b. Lipoprotein lipase

c. Protein kinase

d. Adenylate cyclase

e. Phospholipase C

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

a. Allopurinol

b. Proserin

c. Sodium diclophenac

d. Aspirin

e. Indometacin

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

a. Glycoproteins

b. Ketone bodies

c. Metalloproteins
d. Lipoproteins
e. Purine nucleotides

102. A 30 year-old patient suffering from pulmonary tuberculosis has been prescribed isoniazid. Continuous taking of this drug may lead to the deficiency of the following vitamin:
a. Pyridoxine
b. Cobalamin
c. Retinol
d. Ergocalciferol
e. Tocopherol

103. A patient has neurasthenic syndrome, diarrhea, dermatitis. This is associated with deficiency of the following vitamin:
a. Vitamin K
b. Folic acid
c. Vitamin B12
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104. Pharmaceutical preparations of protein hydrolysate are applied for parenteral proteinic feeding. Hydrolysates are of full value if they contain essential amino acids. Which of the following amino acids relates to the essential ones:
a. Glycine
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d. Cysteine
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a. Hydrogen
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106. Active form of one of the sulphur-containing amino acids can be used as a methyl group donor for the drug methylation. Specify this amino acid:
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d. Bile acids
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a. D
b. P

c. B1
d. A
e. B2

109. High-grade deficit of the ascorbic acid causes development of scorbutus. This pathology develops due to the disturbed synthesis of the following connective tissue protein:
a. Prothrombin
b. Albumin
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110. Cardiac diseases are treated with cocarboxylase preparation. This preparation is the coenzymatic form of the following vitamin:
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b. Hyaluronic acid
c. Chondroitin-4-sulfate
d. Chondroitin-6-sulfate
e. Keratan sulfate

112. Depressive states can be treated by means of drugs inhibiting the enzyme that inactivates biogenic amines. Specify this enzyme:
a. CPK (creatine phosphokinase)
b. LDH (lactate dehydrogenase)
c. MAO (monoamine oxidase)
d. AST (aspartate aminotransferase)
e. ALT (alanine aminotransferase)

113. Oxidative deamination of biogenic amines in the tissues is catalyzed by the following enzyme:
a. Alanine transaminase
b. Aspartate transaminase
c. Monoaminooxidase
d. Decarboxylase
e. Acetylcholinesterase

114. Analysis of a patient’s urine revealed increased concentration of the uric acid. The patient was prescribed allopurinol. What is the biochemical mechanism of its action?
a. Phosphorylase inhibition
b. Nucleosidase inhibition
c. Cyclooxigenase activation
d. Desaminase inhibition
e. Xanthine oxidase inhibition

115. Blood serum electrophoresis revealed interferon. This protein is in the following fraction:
a. β-globulins
b. Albumins
c. α1-globulins
d. α2-globulins
e. γ-globulins

116. It is known that the unconjugated bilirubin being the product of heme catabolism is detoxicated

in liver. Which compound is involved into the bilirubin detoxication within the hepatocytes?

a. Glucuronic acid
b. Mevalonic acid
c. Glycin
d. Lactic acid
e. Urea

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

a. Cholesterol
b. Bile acids
c. Acetone
d. Amino acids
e. Nucleic acids

118. Interaction of catecholamines with β-adrenoreceptors increases the level of cyclic adenosine monophosphate in tissue cells. Name an enzyme that catalyzes reaction of cyclic adenosine monophosphate generation:

a. Guanylate cyclase
b. Creatine kinase
c. Phosphodiesterase
d. Phosphatase
e. Adenylate cyclase

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

a. Acetyl-CoA
b. Levulinic acid
c. Tyrosine
d. Cholesterol
e. Malonyl-CoA

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

a. C
b. B2
c. B1
d. B6
e. B12

121. Biochemical function of water-soluble vitamins depends on their ability to turn into the coenzymatic forms. Specify the coenzymatic form of the vitamin B2 (riboflavin):

a. TDP (thiamine diphosphate)
b. PALP (pyridoxal phosphate)
c. NAD+ (nicotinamide adenine dinucleotide)
d. TMP (thiamine monophosphate)
e. FMN (flavin mononucleotide)

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

a. Hemolytic
b. Parenchymatous
c. Obstructive
d. Gilbert's disease
e. Neonatal jaundice

123. A patient complains of pain behind the breastbone on the left, perspiration and palpitation.

Which of the following enzymes should be found in blood in order to confirm the diagnosis of myocardium infarction?

a. α-fetoprotein, aldolase, CPK

b. AspAT, CPK, LDH-1

c. Amylase, alkaline phosphatase, AlAT

d. AlAT, aldolase, LDH-4

e. Acid phosphatase, LDH-5, LDH-4

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

a. Valine

b. Alanine

c. Glycin

d. Histidine

e. Serine

125. Single-oxygenase system of membranes of endoplasmic hepatocyte reticulum includes flavoprotein NADF-cytochrome, R-450-reductase and R-450-cytochrome. It stimulates inactivation of biologically active substances or neutralization of toxic compounds by catalyzing the reaction of:

a. Reduction

b. Hydroxylation

c. Methylation

d. Oxidation

e. Acetylation

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

a. Folic

b. Nicotinic

c. Pangamic

d. Pantothenic

e. Lipoic

127. Sulfonamides are widely used as bacteriostatic agents. The mechanism of antimicrobial action of sulfonamides is based on their structural similarity to:

a. Folic acid

b. Glutamic acid

c. Para-aminobenzoic acid

d. Nucleic acid

e. Antibiotics

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

a. Fat

b. Tocopherol

c. Common salt

d. Nicotinic acid

e. Protein

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

a. Adenine

b. Glutamine

c. Alanine

d. Uridine

e. Guanine

130. Introduction of glucocorticoids induces strengthening of glucose concentration in blood. Which of

the following processes will be activated in liver?

a. Glycolysis

b. Gluconeogenesis

c. Oxidation of fatty acids

d. Glycogenolysis

e. Ketogenesis

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

a. Cholesterol

b. Glycine

c. Glucose

d. Methionine

e. Bilirubin

132. Decarboxylation of the amino acid histidine results in formation of histamine in the cells. Neutralization of this biogenic amine takes place due to the following enzyme:

a. Aminotransferase

b. Aminopeptidase

c. Monoaminooxidase (MAO)

d. Catalase

e. Diaminooxidase (DAO)

133. Blood analysis revealed rise of activity of LDH1, LDH2, aspartate aminotransferase, kreatine phosphokinase-MB. Biochemical disorder is observed in the following organ:

a. Heart

b. Kidneys

c. Pancreas

d. Liver

e. Skeletal muscles

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

a. Pepsin, gastricsin

b. Lipase, phospholipase

c. Enterokinase, lipase

d. Amylase, maltase

e. Trypsin, chemotrypsin

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

a. Phenylalanine

b. Lactate

c. Malate

d. Aspartate

e. Succinate

136. For treatment of the psychosis a patient was administered the neuroleptic aminazine. The main way of its biotransformation in the organism is induction of microsomal oxidation. Specify the principal component of this system:

a. Cytochrome oxidase

b. Cytochrome C

c. Cytochrome R-450

d. NAD-dehydrogenase

e. CoQ-reductase

137. Anti-inflammatory effect of a number of drugs is caused by the inhibition of arachidonic acid

release. This acid is the precursor of:
a. Haem
b. Cholesterol
c. Uric acid
d. Urea
e. Prostaglandins

138. Some products of amino acid decarboxylation are biologically active substances. What CNS inhibition mediator is formed by decarboxylation of glutamic acid?
a. Asparagine
b. GABA
c. Histamine
d. Putrescine
e. Cadaverine

139. A patient with low immunity, frequent colds is recommended to take ascorutine as a more effective drug than ascorbic acid. What constituent substance of this preparation intensifies action of vitamin C?
a. Glucose
b. Vitamin A
c. Vitamin P
d. Lactose
e. Vitamin D

140. In order to prevent adipose degeneration of liver after the viral hepatitis a patient should be administered lipotropins. Name one of them:
a. Vicasol
b. Choline
c. Allopurinol
d. Tryptophan
e. Contrykal

141. Blood analysis of a patient revealed high content of the following enzymes: creatine kinase (MB-isoform), aspartate aminotransferase and LDH 1,2. What pathology should be suspected in this case?
a. Myocardium infarction
b. Liver cirrhosis
c. Pancreatitis
d. CNS affection
e. Muscular dystrophy

142. Patients joints are enlarged, look like thickened disfigured knots. Blood analysis revealed high concentration of uric acid and its salts. This state is caused by metabolic disorder of the following substances:
a. Porphyrines
b. Pyrimidines
c. Purines
d. Cholesterol
e. Phospholipids

143. Inflammatory processes in the gall bladder exert negative influence on the colloidal properties of bile. This may lead to gallstone formation. One of the causes of their formation is the crystallization of the following substance:
a. Albumine
b. Urates
c. Oxalates
d. Cholesterol
e. Haemoglobin

144. Some proteins in the human organism have buffer properties. Which aminoacid allows hemoglobine to reveal its buffer properties in blood?

a. Valine
b. Threonine
c. Alanine
d. Isoleucine
e. Histidine

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

a. Proline
b. Serine
c. Glutamine
d. Tyrosine
e. Tryptophan

146. Transamination is the biochemical process in which amino groups of different amino acids take form of one of the amino acids. What amino acid is it?

a. Glycine
b. Leucine
c. Arginine
d. Glutamic
e. Valine

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

a. Activates lypogenesis
b. Activates glycogenolysis
c. Inhibits glycogenolysis
d. Activates alcoholic fermentation
e. Inhibits glycolysis

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

a. LDH5 activity
b. Activity of pancreatic lipase
c. Concentration of high-density lipoproteins
d. Concentration of chylomicrons
e. Concentration of low-density lipoproteins

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

a. Tryptophane
b. Valine
c. Glycin
d. Glutamate
e. Methionine

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

a. Alpha-glycerolophosphate
b. Lactate
c. Acetyl coenzyme A
d. Choline
e. Pyruvate

151. Under anaerobic conditions during glycolysis ATP is synthesized by the way of substrate phosphorylation. This process uses energy of other high-energy compounds. Specify one of such

compounds:
a. Lactate
b. Glucose 6-phosphate
c. Phosphoenol pyruvate
d. Pyruvate
e. Glucose

152. Decarboxylation of 5-hydroxytryptophane gives origin to a certain biogenic amine with vasoconstrictive action. What biogenic amine is it?
a. Putrescine
b. Cadaverine
c. Histamine
d. Gamma-aminobutyric acidc
e. Serotonin

153. A male patient who suffers from chronic intestinal obstruction has intensified putrefaction of proteins in the colon. What toxic substance originates from tryptophane in this case?
a. Kreatine
b. Glucose
c. Bilirubin
d. Lactate
e. Indole

154. A patient has been administered L-carnitine. This preparation ensures transmembrane transfer of the following substances:
a. Purine nucleotides
b. Amino acids
c. Higher fatty acids
d. Pyrimidine nucleotides
e. Glucose

155. An elderly woman complains of twilight vision impairment. Which of the following vitamins should be administered in this case?
a. D
b. PP
c. C
d. E
e. A

156. Low rate of vitamin B6 in the dietary intake leads to disturbance of protein metabolism. What biochemical processes in the patient's organism will become less active?
a. Transamination
b. Phosphorilation
c. Hydrolysis
d. Methylation
e. Reduction-oxidation

157. Systematic and intensive physical exercise causes reduction of fat concentration in the adipose tissues. It is released from the cells into the blood in form of:
a. Glucose
b. Free fatty acids and glycerine
c. Lipoproteins
d. Chylomicrons
e. Ketone bodies

158. Dehydregenases are enzymes that detach hydrogen atoms from the substrate. What enzyme class is lactate dehydrogenase related to?
a. Oxidoreductases

b. Hydrolases
c. Lipases
d. Isomerases
e. Transferases

159. A woman in labour was given a preparation that activates contractions of smooth uterine muscles. What hormone is contained in this preparation?
a. Gastrin
b. Angiotensin
c. Bradykinin
d. Oxytocin
e. Secretin

160. Patients ill with tuberculosis take a drug that is an antivitamin of nicotinic acid. Name this substance:
a. Sulfanilamide
b. Isoriboflavin
c. Oxythiamine
d. Isoniazid
e. Acrichine

161. Bile contains of bile acids. choose one of them:
a. Cholic
b. Lactic
c. Pyruvic acid
d. Arachidonic
e. Glutamine

162. The pancreas secretes an enzyme that is able to hydrolyze α-1,4-glycosidic linkages in a glycogen molecule. Specify this enzyme:
a. Enterokynase
b. Phosphatase
c. α-amylase
d. Chemotrypsin
e. Lysozyme

163. It is known that some chemical compounds uncouple the tissue respiration and oxidative phosphorylation. Name one of these compounds:
a. Lactic acid
b. Acetyl-CoA
c. Carbon monoxide
d. Antimycin A
e. 2,4-dinitrophenol

164. 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?
a. Peptide
b. Disulfide
c. Amide
d. 3',5'-phosphodiester
e. Glycosidic

165. 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:
a. Succinate dehydrogenase
b. Glutaminase
c. Asparaginase
d. Citrate synthase

e. Aspartate aminotransferase

166. 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:

a. Citrate synthetase
b. Aspartate aminotransferase
c. Glutaminase
d. Succinate dehydrogenase
e. Asparaginase

167. 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:

a. Xanthine oxidase
b. Creatine kinase
c. Lactate dehydrogenase
d. Dihydrofolate reductase
e. Hexokinase

168. Addisons (bronze) disease is treated with glucocorticoids. Their effect is provided by the potentiation of the following process:

a. Pentose phosphate cycle
b. Glycolysis
c. Gluconeogenesis
d. Glycogenolysis
e. Ornithine cycle

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

a. Synthesis of glycogen
b. Breakdown of glycogen
c. Breakdown of lipids
d. Breakdown of proteins
e. Gluconeogenesis

170. 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:

a. Biotin
b. Lipoic acid
c. Folic acid
d. Thiamin
e. Pantothenic acid

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

a. Stomach
b. Muscles
c. Liver
d. Kidneys
e. Heart

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

a. Phenylalanine
b. Arginine
c. Methionine
d. Tryptophan
e. Valine

173. 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:

a. Tyrosine
b. Alanine
c. Asparagine
d. Methionine
e. Tryptophan

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

a. Activation of acetylcholinesterase
b. Inhibition of acetylcholinesterase
c. Activation of monoamine oxidase
d. Inhibition of xanthine oxidase
e. Inhibition of monoamine oxidase

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

a. Fatty acid biosynthesis
b. Lipid absorption
c. Lipid transport in blood
d. Glycerol oxidation
e. Cholesterol biosynthesis

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

a. Protein phosphorylation
b. Glycolysis
c. Lipolysis
d. Glycogen synthesis
e. Pentose phosphate pathway

177. L-DOPA and its derivatives are used in treatment of Parkinsons disease. What aminoacid is this substance made of?

a. Tyrosine
b. Glutamate
c. Arginine
d. Tryptophan
e. Asparagine

178. The poultry factory worker, who has been consuming 5 or more raw eggs daily, complains of weakness, drowsiness, muscle pain, loss of hair, seborrhe

a. H (biotin)
b. A (retinol)
c. B1 (thiamine)
d. What vitamin deficiency causes such condition?
e. C (ascorbic acid)

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

a. Oxidative decarboxylation
b. Oxidative phosphorylation
c. Microsomal oxidation
d. Substrate-linked phosphorylation
e. Lipid peroxidation

180. Cataract (lenticular opacity) has developed in the 52-year-old female patient with pancreatic diabetes. What process intensification has caused lenticular opacity?

a. Gluconeogenesis

b. Protein glycosylation
c. Ketogenesis
d. Lipolysis
e. Protein proteolysis

181. Detoxication rate is 4 times lower in children than in adults. What enzyme necessary for toxic compounds conjugation has low activity in children?
a. LDH1
b. Glucuronosyltransferase
c. AspAT
d. ALAT
e. Creatine phosphokinase

182. Milk intake has resulted in the one-year-old child having diarrhea and abdominal distension. What enzyme deficiency does the child have?
a. Aldolase
b. Maltase
c. Lactase
d. Hexokinase
e. Glycosidase

183. When hydrogen peroxide solution is administered to bleeding wounds, it is broken up by one of the blood enzymes. Point out this enzyme.
a. Monoamine oxidase
b. Aspartate aminotransferase
c. Lactate dehydrogenase
d. Catalase
e. Cytochrome oxidase

184. 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. Succinate dehydrogenase
b. NADH-coenzyme Q reductase
c. Cytochrome C reductase
d. Cytochrome oxidase
e. Adenosine triphosphate synthetase

185. 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. Transcription initiation
c. Replication initiation
d. Transcription termination
e. Translation termination

186. Inhibitors of one of the amides metabolism enzymes are used to treat depression. What enzyme inhibition has such an effect?
a. Acetylcholinesterase
b. Kynurenine 3-hydroxylase
c. Lactate dehydrogenase
d. Flavin adenine dinucleotide (FAD)-containing monoamine oxidase (MAO)
e. Formylkynureninase (Arylformamidase)

187. In large intestine microorganisms synthesize vitamins that participate in organisms biochemical processes. What vitamins are mainly synthesized by microflora?
a. B1, B2
b. B6, E
c. A, C

d. E, PP

e. K, B12

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

a. Post-translational modification of peptides

b. Post-translational modification of RNA

c. DNA replication

d. RNA transcription

e. Protein biosynthesis