List of MCQs for the final exam 2023

(correct answer is in the first column)

2	1	Active center of enzyme can be defined as follows:	Site on the enzyme molecule, which binds substrate and provides its further transformation.	Part of the molecule, which easily splits from apoenzyme.	Nonprotein component of enzyme molecule	Site for binding of allosteric effector.	Whatever part of polypeptide chain of enzyme molecule.
3	1	In humans most enzymes have an optimal temperature of action at:	37 ^oC	100 ^oC	0 ^oC	20 ^oC	30 ^oC
4	1	The fourth position in classification of enzymes is occupied by:	Lyases	Transferases	Isomerases	Hydrolases	Ligases
5	1	Active centers in nonconjugated (simple) enzymes, e.g.trypsin, are formed by the next constituents of enzyme molecule:	Amino acid side chains only	Peptide bonds between selected amino acids	Nucleotides	Carbohydrates	Phospholipids
6	1	What type of reactions presented below is catalyzed by hydrolases?	A-B + H_2O = A-OH	AH_2 + B = A + B	A+B+ATP= A-B + AI	A-B = A + B	A-R-B = A-B-R
7	1	In intact cell, the free energy change (ΔG') associated with an enzyme-catalyzed reaction is frequently different from the standard free energy change (ΔG') of the same reaction because in the intact cell the	Activation energy is different	Reaction is always near equilibrium	Enzyme may be regulated allosterically	Reactants are not at 1 M concentrations	Reaction may be catalyzed by more than one enzyme

8	1	After the addition of an extract of pancreatic gland to the tube with starch solution a blue coloration of the sample with iodine have disappeared, which indicates on starch hydrolysis. What pancreatic enzyme is involved in this reaction?	Amylase	Chymotrypsin	Lipase	Trypsin	Aldolase
9	1	The enzymes of the citric acid cycle are located in:	Mitochondrial matrix	Extramitochondrial soluble fraction of the cell	Nucleus	Endoplasmic reticulum	Lysosomes
10	1	Enzymes differ from inorganic catalysts by the next property:	Thermolability	Acceleration of reaction equilibrium achievement	Sensitivity to catalyst poisons	Thermostability	No selectivity to type of catalyzed reaction
11	1	In a patient was detected disorder in digestion of protein in stomach and small intestines. What group of enzymes may cause this disorder?	Proteinases	Amylase	Lipase	Lyases	Aminotransferases
12	1	How are called enzymes which catalyze the same reaction, are of the same origin but differ in chemical properties?	Izoenzymes	Apoenzyme	Coenzyme	Holoenzyme	Zymogen
13	1	As cofactors of enzymes the most frequently met are the next compounds:	Vitamins, modified by cell enzymes (vitamin derivatives)	Native vitamins	Hormons, e.g.thyroxine	Carbohydrates	Polynucleotides
14	1	The pH optima of most of the enzymes is:	Between 6 and 8	Between 1 and 3	Between 4 and 6	Between 8 and 12	Above 12

15	1	The first position in classification of enzymes is occupied by:	Oxidoreductases	Isomerases	Hydrolases	Transferases	Ligases
16	1	What type of presented below reactions is catalyzed by dehydrogenases?	$AH_2 + B = A + BH_2$	A+B+ATP= A-B + ADP + P_i	A-B + H_2O = A-OH + B-H	A-B = A + B	A-R-B = A-B-R
17	1	Enzymes accelerate chemical reaction due the to next effect:	Enzymes lower the energetic barrier of chemical reaction	Enzymes shift the position of equilibrium of chemical reaction.	Enzymes make possible endergonic reaction without energy supply	Enzymes increase the free energy of activation	-
18	1	An enzyme that catalyzes the conversion of an aldose sugar to a ketose sugar would be classified as one of the:	Isomerases	Oxidoreductases	Transferases	Hydrolases	Liases
19	1	In the cell, enzymes are located in subsequent organelles, providing their specific functioning. Note enzymes located in lysosomes.	Cathepsins and glucosaminidase	Fatty acid synthesis enzyme complex	Enzymes of protein biosynthesis	Enzymes of urea synthesis	Glycogen synthetase and branching enzyme
20	1	Cytochrome c participates in transport of electrons in respiratory chain of the cell and is located in the next cellular compartment:	Mitochondria	Nucleus	Cytoplasm	Golgi vesicles	Lysosomes
21	1	Chose from list below, enzyme belonging to class of hydrolases:	Thrombin	Lactate dehydrogenase	Glucokinase	Phenol oxidase	Aldolase

22	1	Chose from listed below enzymes ONE which exhibits selectivity to stereochemical epimers of substrate:	Urease	Aminopeptidase	Trypsin	Alcohol dehydrogenase	Lactate dehydrogenase
23	1	The energy required to start an enzymatic reaction is called:	Activation energy	Chemical energy	Metabolic energy	Potential energy	Free energy
24	1	In dietology, in cases of children milk intolerance a milk is used in which lactose content is diminished enzymatically. What enzyme is used for this purpose?	β-galactosidase	α–glucosidasde	α–amylase	β–glucosidase	β–amylase
25	1	Pepsin has the next pH optimum for enzymatic activity:	pH 1,5	pH 5,1	pH 7,5	pH 8,0	pH is non significant
26	1	Chose from listed below enzymes, ONE which represents class hydrolases:	Pepsin	Aldolase	Glucokinase	Phenol oxidase	ATP synthase
27	1	In the cell, enzymes are located in subsequent organelles, providing their specific functioning. Note enzymes located in lysosomes.	Cathepsins and glucosaminidase	Fatty acid synthesis enzyme complex	Enzymes of protein biosynthesis	Enzymes of urea synthesis	Glycogen synthetase and branching enzyme
28	1	Coenzymes are:	Heat stable, dialyzable, non protein organic molecules	Soluble, colloidal, protein molecules	Structural analogue of enzymes	Different forms of enzymes	Inorganic catalists
29	1	Chose from list below enzymes, which exhibits specificity to peptide bonds:	Chymotrypsin	Urease	Alcohol dehydrogenase	Arginase	Cellulase
30	1	Multiple forms of the same enzymes are known as:	Isoenzymes	Proenzymes	Pre-enzymes	Coenzymes	Zymogens

31	1	Chose from list below enzymes located in nucleus:	RNA polymerases	Enzymes of protein biosynthesis	Enzymes of tricarboxylic acid cycle	Cathepsins and glucosaminidase	Glycogen synthetase and branching enzyme
32	1	In human saliva there is an enzyme able to hydrolyze the α[1→4] glucosidic bonds in the molecule of starch. Name this enzyme:	α-Amylase	Phosphatase	Fructofuranosidase	β-Galactosidase	Lysozyme
33	1	In active center of enzymes which catalyze hydrolysis of substrate (hydrolases) usually is present the next amino acid residue:	Histidine	Leucine	Phenylalanine	Proline	Valine
34	1	Michaelis-Menten constant (K_m) reflects the next property of enzyme:	Affinity to substrate	Sensitivity to pH of medium	Thermolability	Affinity to a product of reaction	Sensitivity to competitive inhibitors
35	1	Out of 200 different amino acids form in nature the number of amino acids present in protein:	20	25	35	49	100
36	1	Michaelis-Menten constants of two enzymes are $1,3x10^{-5}$ M/l and $2,3x10^{-3}$ M/l subsequently. Indicate true statement about the affinity of these enzymes to substrate.	The first enzyme has higher affinity to substrate	Enzymes possess equal affinity to substrate	The second enzyme has higher affinity to substrate	For decision an information on concentration of enzyme is needed	Data are incomplete and it is impossible to draw a conclusion
37	1	According to international convention (EC) as a unit of enzymatic activity is accepted 1 catal, which can be defined as:	Quantity of enzyme which transform 1 mole of substrate in 1 second	Quantity of enzyme which transform 1 umole of substrate in 1 minute	Quantity of enzyme which transform 1 umole of substrate in 1 second	Activity of 1 mg of pure enzyme	Number of substrate molecules transformed in 1 minute

38	1	Enzymes requiring NAD as co-substrate can be assayed by measuring change in absorbance at:	340 nm	210 nm	290 nm	365 nm	690 nm
39	1	In active center of enzymes which catalyze hydrolysis of substrate (hydrolases) usually is present the next amino acid residue:	Glutamic acid	Leucine	Phenylalanine	Proline	Valine
40	1	An esterase with rates of reaction for the hydrolysis of various esters above probably has an active site that:	Contains a hydrophobic recognition site	Contains a thiol	Contains a thamine pyrophosphate cofactor	Is very similar to that of trypsin	Shows allosteric control
41	1	Ambulance delivered a patient to the hospital with a preliminary diagnosis “acute pancreatitis”. What enzyme activity must be estimated in blood and urine in order to support this diagnosis?	Alpha-amylase	AlAT (GPT)	AsAT (GOT)	Gamma-amylase	Lactate dehydrogenase
42	1	Activity of many enzymes depends from the presence of free thiol groups in active center. What amino acid residue provides presence of these groups in enzyme molecule?	Cysteine	Lysine	Tryptophan	Methionine	Serine
43	1	Michaelis-Menten constant corresponds to:	Substrate concentration at which reaction rate is half maximal	Optimal pH for activity of enzyme	Enzyme concentration, which provides half maximal velocity of reaction	Concentration of substrate, at which rate of reaction reach maximal value	Ionic strength of medium favoring maximal activity of enzyme
44	1	The Michaehis-Menten hypothesis:	Postulates the formation of an enzyme substrate complex	Enables us to calculate the isoelectric point of an enzyme	States that the rate of a chemical reaction may be independent of substrate concentration	States that the reaction rate is proportional to substrate concentration	-

45	1	'Lock' and 'Key' model of enzyme action proposed by Fisher implies that:	The active site is complementary in shape to that of the substrate	The active site is flexible and adjusts to substrate	The active site requires removal of PO_4 group	The active site is not changed	Substrates change conformation prior to active site interaction
46	1	Ethylene glycol, the major ingredient in antifreeze, is occasionally consumed by alcoholics as a substitute of true alcohol beverages. In metabolism of ethylene glycol a highly toxic aldehyde is produced, much more toxic than acetaldehyde, produced from ethanol. Ethanol is often administered as a treatment in cases of ethylene glycol poisoning. What is the most likely reason that ethanol is an effective treatment for ethylene glycol poisoning?	Alcohol dehydrogenase (ADH) exhibits a much lower Michaelis constant (K_m) for ethanol than for ethylene glycol	Ethanol is an allosteric effector of ADH in addition to being a substrate	Ethanol combines with a toxic product formed by the reaction of ADH with ethylene glycol and converts it to a harmless product	Acetaldehyde, which is produced by the reaction of ADH with ethanol, is of therapeutic value	Ethanol induces another enzyme which effectively metabolize ethylene glycol
47	1	The role of an enzyme in a chemical reaction is to:	Speed up the reaction	Emulsify fats	Prevent denaturation	Buffer any acids or bases	Slow down the reaction
48	1	Choose from listed below methods ONE, which is used for fractionation of protein mixtures and isolation of individual proteins (enzyme, hormone, toxin etc):	Affinity chromatography	Precipitation with nitric acid	Boiling of extracts	Proteolysis	Radioimmunoassay
49	1	Determination of C-reactive protein (CRP) in blood plasma is conducted with the use of antisera, containing specific antibodies against CRP. What type of analytical method is used in this case?	Immunoprecipitation	Spectrophotomenry	Electrophoresis	Chromatography	Polarography

50	1	Proteins are biopolymers of principal significance in cell building, they are composed from amino acids as monomers, which are connected into chain by the next main type of chemical bond:	Peptide bond	Phosphodiester bond	Ionic bond	Hydrogen bond	Glycosidic bond
51	1	Protein preparations from human blood plasma are frequently used in clinical medicine for treatment of many diseases. Fractionation of blood plasma and preparation of distinct protein fractions is achieved by the next method:	Fractional precipitation with ammonium sulfate	Fractional precipitation with ethanol by Cohn VI method	Precipitation with salts of heavy metals	Electrophoresis in agarose gel	Ultracentrifugation
52	1	Determination of proportion between protein fractions in blood plasma or serum has an important clinical and diagnostic significance. The following routine method for obtaining results of this sort is most frequently used in clinical laboratories:	Salting out with neutral salts	Absorption chromatography	Precipitation with strong acids	Electrophoresis in agar gel or on acetyl-cellulose films	Immunoprecipitation
53	1	For determination of DNA synthesis in the cell usually is used measurement of incorporation of H^3-thymidine into cellular biopolymers. The next type of analysis is used in this specific case:	Radioisotope method	Polymerase chain reaction (PCR)	Electrophoresis	Radioimmunoassay	Affinity chromatography
54	1	Proteins are biopolymers of principal significance in cell building, they are composed from amino acids as monomers, which are connected into chain by the next main type of chemical bond:	Peptide bond	Phosphodiester bond	Ionic bond	Hydrogen bond	Glycosidic bond
55	1	Mitochondria are subcellular organelles and are present in a cytoplasm of every cell exept mature red blood cells, bacteria, blue-green algae. What method is used principally for their isolation?	Differential centrifugation	Chromatography	Electrophoresis	Spectrophotometry	Gel-filtration

56	1	∗To a 62-year-old man Disulfiram (Antabuse) was recommended in a course of the alcoholism treatment. On which type of enzyme (aldehyde dehydrogenase) inhibition mechanism of this drug action is based?	Irreversible	Competitive	Noncompetitive	Feedback	Allosteric
57	1	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	Arginase	Carbonic anhydrase	Histidine decarboxylase	Hexokinase
58	1	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	Glutaminase	Succinate dehydrogenase	Citrate synthetase	Aspartate aminotransferase
59	1	A patient was found to have an increased blood serum LDH-1 activity. Inwhich organ is the pathological processlocalized?	Heart	Liver	Kidneys	Stomach	Muscles
60	1	A patient has been admitted to the contagious isolation ward with signs of jaundice caused by hepatitis virus. Which of the symptoms given below is strictly specific for hepatocellular jaundice?	Increase of ALT, AST level	Hyperbilirubinemia	Bilirubinuria	Cholemia	Urobilinuria
61	1	A patient who had been taking diclofenac sodium for arthritis of mandibular joint developed an acute condition of gastric ulcer. Such side effect of this medicine is caused by inhibition of the following enzyme:	Cyclooxygenase-1 (COX-1)	Cyclooxygenase-2 (COX-2)	Lipoxygenase	Phosphodiesterase	Monoamine oxidase

62	1	A 46-year-old female patient has continuous history of progressive muscular (Duchenne's) dystrophy. Which blood enzyme changes will be of diagnostic value in this case?	Creatine phosphokinase	Lactate dehydrogenase	Pyruvate dehydrogenase	Glutamate dehydrogenase	Adenylate cyclase
63	1	A patient is diagnosed with cardiac infarction. Blood test for cardiospecific enzymes activity was performed. Which of the enzymes has three isoforms?	Creatine kinase	Lactate dehydrogenase	Aspartate transaminase	Alanine transaminase	Pyruvate kinase
64	1	A patient has been diagnosed with alkaptonuria. Choose an enzyme that can cause this pathology when deficient:	Homogentisic acid oxidase	Phenylalanine hydroxylase	Glutamate dehydrogenase	Pyruvate dehydrogenase	Dioxyphenylalanine decarboxylase
65	1	For biochemical diagnostics of myocardial infarction it is necessary to measure activity of a number of enzymes and their isoenzymes. What enzymatic test is considered to be the best to prove or disprove the diagnosis of infarction in the early period after the chest pain is detected?	Creatine kinase isoenzyme CK-MB	Creatine kinase isoenzyme CK-MM	LDH1 lactate dehydrogenase isoenzyme	LDH2 lactate dehydrogenase isoenzyme	Aspartate aminotransferase cytoplasmic isoenzyme
66	1	A 15-year-old boy has been diagnosed with acute viral hepatitis.What blood value should be determined to confirm acute affection of hepatic cells?	Aminotransferase activity (AST, ALT)	Unconjugated and conjugated bilirubin content	Erythrocytes sedimentation rate (ESR)	Cholesterol content	Protein fraction content
67	1	A 50-year-old woman diagnosed with cardiac infarction has been delivered into an intensive care ward. What enzyme will be the most active during the first two days?	Aspartate aminotransferase	Alanine aminotransferase	Alanine aminopeptidase	LDH4	LDH5

68	1	Name the drug that inhibits excretory function of pancreas during treatment of acute pancreatitis:	Contrykal (Aprotinin)	Allochol	Panzynorm	Pancreatin (Mezym forte)	Festal
69	1	In recognition of hepatitis the determination the following enzymes activity in blood has diagnostic significance:	Amino transferases	Amylase	Lactate dehydrogenase	Aldolase	Creatin kinase
70	1	What is the mechanism of inhibition of folic acid synthesis by sulfanylamides?	Competitive	Irreversible	Due to enzyme denaturation	Uncompetitive	Allosteric inhibition
71	1	Enzymes, which are produced in inactive form in the living cells, are called:	Proenzymes	Papain	Lysozymes	Apoenzymes	Izozymes
72	1	After laboratory investigation in blood of patient an increase of LDH activity was detected, which is characteristic symptom of heart, liver or kidney diseases. What additional biochemical investigation must be performed in differential diagnostics?	Determination of LDH isozymes	Estimation of blood glucose level	Ketone bodies level in blood	Determination of blood cholesterol level	Amylase activity in blood
73	1	In reversible noncompetitive enzyme activity inhibition:	Vmax is reduced	Km is increased	Km is decreased	Vmax is not changed	Concentration of active enzyme is reduced
74	1	Pharmaceuticals, containing mercury, arsen or other heavy metals, are inhibiting enzymes, posessing sulfhydril groups. What amino acid is used for reactivation of these enzymes?	Cysteine	Histidine	Isoleucine	Aspartic acid	Glycine
75	1	In course of tuberculosis treatement a patient was administered isoniazide - a structural analogue of nicotinamide and pyridoxine. What type of inhibition by mechanism of action exhibits isoniazide?	Competitive	Noncompetitive	Allosteric	Irreversible	Uncompetitive

76	1	During the surgery after injection of a drug, which cause the myorelaxation, in patient happens a prolonged stop of resptration (more then 5 min). What enzyme insufficiency may be responcible for this accident?	Acetylcholine esterase	Catalase	Glucose-6-phosphate dehydrogenase	Monoaminoxidase	Acetyl-transferase
77	1	How are called enzymes which catalyze the same reaction, are of the same origin but differ in chemical properties?	Izoenzymes	Apoenzyme	Coenzyme	Holoenzyme	Zymogen
78	1	In a patient with complaints on pain in cardiac area a myocardial infarction was recognized after estimation of enzymes activity in blood. Indicate, please, what enzyme activities were determined?	LDH, creatine kinase, aminotransferase	Amylase, lipase, phosphatase	Peptidase, arginase, glucokinase	Trypsin, lysozyme, citrate synthase	Aldolase, succinate dehydrogenase, hexokinase
79	1	Albinism is due to deficiency of the enzyme:	Tyrosinase	Phenylalanine hydroxylase	p-Hydroxyphenylpyruvic acid oxidase	Tyrosine dehydrogenase	Histidine decarboxylase
80	1	Ambulance delivered a patient to the hospital with a preliminary diagnosis “acute pancreatitis”. What enzyme activity must be estimated in blood and urine in order to support this diagnosis?	Alpha-amylase	AlAT (GPT)	AsAT (GOT)	Gamma-amylase	Lactate dehydrogenase
81	1	In blood serum of a patient a marked increase in activity of trypsine, alpha-amylase and lipase was detected. What disease can be suggested?	Acute pancreatitis	Cholestasis	Chronic hepatitis	Malignant tumors	Insecticide poisoning

82	1	In blood serum of a patient a marked increase of activity of creatine phosphokinase and lactate dehydrogenase was detected. What disease can be suggested as a cause?	Myocardial infarction	Acute pancreatitis	Chronic pancreatitis	Hemolytic jaundice	Nephrosis
83	1	In blood serum of a patient a high activity of isozyme LDH-1 was detected. In what organ pathological changes occure?	Heart	Liver	Sceletal muscles	Pancreas	Kidney
84	1	In a patient a preliminary diagnosis of myocardial infarction was proposed. A characteristic feature of this disease is a marked increase in blood in the first 24 hours of the next enzyme:	Creatine-phosphokinase	Arginase	Catalase	Glc-6-P dehydrogenase	Alpha-amylase
85	1	During investigation of gastric secretory function was detected decrease of hydrochloric acid content in gastric juice. What enzyme activity will decrease in this case?	Pepsin	Lipase	Hexokinase	Amylase	Carboxypeptidase
86	1	In dietology in cases of children milk intolerance a milk is used in which lactose content is diminished enzymatically. What enzyme is used for this purpose?	β-galactosidase	α–glucosidasde	α–amylase	β–glucosidase	β–amylase
87	1	In cases of chronic pancreatitis a decrease of trypsin production and secretion is observed. Digestion and absorption of what substances is injured in this case?	Cleavage of proteins	Cleavage of polysaccharides	Cleavage of nucleic acids	Cleavage of disaccharides	Cleavage of lipids

88	1	After the addition of an extract of pancreatic gland to the tube with starch solution a blue coloration of the sample with iodine have disappeared, which indicates on starch hydrolysis. What pancreatic enzyme is involved in this reaction?	Amylase	Chymotrypsin	Lipase	Aldolase	Trypsine
89	1	The activation of chymotrypsinogen is achieved by the next process:	Limited proteolysis	Phosphorylation of serine residues with the use ofATP	Acetylation of free amino groups	ADP-ribosylation	Carboxylation of aspartic acid residues
90	1	In a patient the disorder of proteins digestion in stomach and small intestine is observed. What enzymes insufficiency cause this disorder?	Peptidases	Oxido-reductases	Amylases	Lipases	Aminotransferases
91	1	An allosteric inhibitor influences the enzyme activity by	Changing the conformation of the enzyme by binding to a site other than catalytic site	Competiting for the catalytic site with the substrate	Changing the specificity of the enzyme for the substrate	Changing the nature of the products formed	Changing the nature of the substrates
92	1	Which of the following regulatory reactions involves a reversible covalent modification of an enzyme?	Phosphorylation of serine OH on the enzyme	Allosteric modulation	Competitive inhibition	Non-competitive inhibition	Feedback inhibition
93	1	Trypsinogen is produced in exocrine part of pancreatic gland and excreted to duodenum, where it is activated by the next factor:	Enteropeptidase	Secretin	Gastrin	Cholecystopancreozymine	Chymotrypsinogen

94	1	During the investigation of pancreatic juice was detected a great number of enzymes. Some of them are secreted in inactive form. What these enzymes are?	Trypsinogen, chymotrypsinogen	Sucrase, amylase	Ribonuclease, pepsin	Amylase, lipase	DNA-ase, aminopeptidase
95	1	An allosteric modulator influences enzyme activity by:	Binding to a site on the enzyme molecule distinct from the catalytic site	Competing for the catalytic site with the substrate	Changing the nature of the product formed	Changing the specificity of the enzyme for its substrate	Covalent modification of enzyme
96	1	Phosphororganic compound diisopropyl-fluorophosphate is a dangerous toxin as it inhibits cholinesterase. What is the mechanism of this inhibition?	Irreversible	Reversible	Competitive	Uncomoetitive	Noncompetitive
97	1	Competitive inhibitor of succinate dehydrogenase is the next substance:	Malonate	Oxaloacetate	Alanine	Fumarate	α-Ketoglutarate
98	1	In diagnostics of myocardial infarction the next isoform of lactate dehydrogenase in blood has diagnostic significance:	H_4 (iso 1)	H_3M (iso 2)	H_2M_2 (iso 3)	HM_3 (iso 4)	M_4 (iso 5)
99	1	In rickets the next enzyme activity is highly elevated in blood serum:	Alkaline phosphatase	Lactate dehydrogenase	Aldolase	Alanyl aminotransferase	Amylase
100	1	In malignant tumor of prostata a marked increase in activity of the next enzyme in blood serum is observed:	Acid phosphatase	Lactate dehydrogenase	Aldolase	Alanyl aminotransferase	Alkaline phosphatase

101	1	How many polipeptide chains (subunits) contains molecule of creatine kinase?	Two	One	Three	Four	Six
102	1	On the third day following onset of acute myocardial infarction, which enzyme estimation will have the best predictive value?	Serum LDH	Serum AST	Serum CK	Serum ALT	Serum amylase
103	1	Multiple forms of the same enzymes are known as:	Isoenzymes	Proenzymes	Pre-enzymes	Coenzymes	Zymogens
104	1	What enzyme may be used in substitute therapy in cases of gastric secretion insufficiency?	Pepsin	Trypsin	Hyaluronidase	Collagenase	Ribonuclease
105	1	Feedback inhibition of enzyme action is affected by:	End products	Enzyme	Substrate	Allosteric inhibitor	None of these
106	1	Different forms of lympholeukoses are effectively cured with enzyme preparation called as:	Asparaginase	Plasmin	Tissue plasminogen activator (tPA)	Hyaluronidase	Streptokinase
107	1	In competitive enzyme activity inhibition	Apparent Km is increased	Apparent Km is decreased	Vmax is increased	Vmax is decreased	Km remains unaffective
108	1	What enzyme is employed as a pharmaceutical for treatement of suppurative wounds?	Trypsin	Catalase	Alkaline phosphatase	Acid phosphatase	Arginase

109	1	Cardiac muscle contains which of the following CK isoenzyme?	MM and MB only	BB only	MM and BB only	MM, BB and MB	MM only
110	1	Liver and skeletal muscle disorders are characterized by on disk proportionate increase in which of the LDH isoenzyme fraction?	LDH-5	LDH-1	LDH-1 and LDH-2	LDH-3 and LDH-4	LDH-2 and LDH-3
111	1	Allopurinol is used in treatment of gout, as it inhibits overproduction of uric acid from hypoxanthine. What enzyme is inhibited by allopurinol?	Xanthine oxidase	Adenosine deaminase	Orotate decarboxylase	Thymidine synthetase	Inosine phosphorylase
112	1	Lactate dehydrogenase is a complex enzyme which consists from the next number of polypeptide chains:	Four	Two	Three	Six	Eight
113	1	Which ligand inactivates an enzyme by occupying its active site?	Competitive inhibitor	Allosteric inhibitor	Non-competitive inhibitor	All of these	Activator
114	1	What enzyme is frequently used in surgery for softening of scars?	Hyaluronidase	Alkaline phosphatase	Catalase	Trypsin	Arginase
115	1	The activity of cyclooxygenase can be suppressed by some medical preparations. What preparation exhibits irreversible inhibitory action upon this enzyme?	Acetylsalicylic acid	Insulin	Allopurinol	Oligomycine	Aminalone
116	1	A 15-month-old child showed weakness and retarded motor skills. It was detected a genetic disease which results from a mutation in the gene coding for the enzyme hexosaminidase A (β-*N*-acetylhexosaminidase) is called what?	Tay-Sachs disease	Lesch-Nyhan syndrome	Huntington disease	Amyotrophic lateral sclerosis	Neurofibromatosis

117	1	A 48-year-old male patient has very high levels of serum cholesterol. A medications (statins) are prescribed that are directed at the rate-limiting step of cholesterol biosynthesis. Which of listed biochemical reactions is affected by such dugs?	Inhibits the enzyme β-hydroxy-β-methylglutaryl-CoA reductase	Stimulates phosphorylation of the β-hydroxy-β-methylglutaryl-CoA reductase enzyme	Decreases the stability of the β-hydroxy-β-methylglutaryl-CoA reductase protein	Binds cholesterol preventing it from being absorbed by the intestine	Directly prevents the deposition of cholesterol on artery walls hydroxymethylglutaryl-CoA reductase
118	1	Irreversible inhibitors are usually toxic compounds, which covalently bind with the enzymes and inactivate them. Which of the following inhibitors is an irreversible one:	Iodoacetate	Malotate	Methanol	Allopurinol	Acetylsalicilic acid
119	1	45 years old male patient was delivered to the hospital with a preliminary diagnosis “acute pancreatitis”. The zymogens of the proteolytic pancreatic enzymes where converted to their catalytically active forms prematurely, inside the pancreatic cells and attack the pancreatic tissue itself. What are these enzymes?	Trypsin, chymotrypsin	Sucrase, amylase	Ribonuclease, pepsin	Amylase, lipase	DNA-ase, aminopeptidase
120	1	Coenzyme A participates in numerous important metabolic reactions. It is a derivativeof the following vitamin:	Pantothenic acid	Thiamine	Niacin	Calciferol	Ubiquinone
121	1	Malaria is treated with structural analogs of vitamin B2 (riboflavin). These drugs disrupt the synthesis of the following enzymes in plasmodium:	FAD-dependent dehydrogenase	Cytochrome oxidase	Peptidase	NAD-dependent dehydrogenase	Aminotransferase
122	1	A 36-year-old female patient as a history of B2-hypovitaminosis.The most likely cause of specific symptoms (epithelial, mucosal, cutaneous, corneal lesions) is the deficiency of:	Flavin coenzymes	Cytochrome A1	Cytochrome oxidase	Cytochrome B	Cytochrome C

123	1	After an extended treatment with sulfanamides a patient has developed macrocytic anemia. Production of active forms of the following vitamin is disrupted in such a condition:	Folic acid	Thiamine	Riboflavin	Pyridoxine	Cyanocobalamin
124	1	The following statements describe coenzymes and prosthetic groups:	Some enzymes contain organic molecules that are derived from vitamins and that are essential for activity. These molecules are called prosthetic groups	Some enzymes contain metal ions such as zinc or copper that are essential for their activity	Coenzymes are small polypeptides that are involved in transfer reactions catalysed by enzymes	Coenzymes are required in some enzyme-catalysed reaction as carried of acyl groups or phosphate groups	Coenzymes are required in some enzyme-catalysed oxidation-reduction reactions involving hydrogen transfer
125	1	Select the metabolic process with which thiaminepyrophosphate is mostly associated:	Decarboxylation of α-ketoacids	Biosynthesis of collagen	Biosynthesis of amino acids	Oxidation of fatty acids	Biosynthesis of prothrombin
126	1	In a patient with frequent intraorgan and mucosal bleeding in urine were detected proline and lysine. Deficiency of what vitamin cause a damage of their hydroxylation?	Vitamin C	Vitamin A	Vitamin K	Vitamin D	Vitamin E
127	1	Pyridoxal phosphate is the coenzyme of enzymes:	Aminotransferases	Reductases	Synthetases	Dehydrogenases	Isomerases
128	1	Biotin as a cofactor participates in the next metabolic reactions:	Incorporation of CO2 into molecules of metabolites (carboxylation)	Decarboxylation of pyruvate	Oxidation of fatty acids	Transfer of phosphate groups (kinase reaction)	Production of H2O2 (oxidase reaction)

129	1	Biochemical functions of water soluble vitamins are realized due to their transformation to coenzymes. What coenzyme is formed by vitamin PP?	NAD (nicotinamide adenine dinucleotide)	FMN (flavinmononucleotide)	FAD (flavin adenine dinucleotide)	Pyridoxalphosphate	Thiamine pyrophosphate
130	1	To a patient suffering from tuberculosis isoniazide was adminitered. Some time later he coplaits on general weakness, disorders of vision, coordination. Application of what vitamin may be usefull for elimination of noted side effects?	Vitamin B6	Vitamin A	Vitamin B2	Vitamin C	Vitamin D
131	1	The coenzyme containing an aromatic hetero ring in the structure is:	TPP	Biotin	Sugar phosphate	Coenzyme Q	Ascorbic acid
132	1	NAD-dependent dehydrogenases, are enzymes which catalyze transfer of the next structural elements of the molecule:	Hydrogen	Phosphate group	Methyl group	Amino group	Oxygen anion
133	1	The next substancs is involved in biosynthesis of NAD:	Vitamin PP	Deoxyribose	Flavine	Ribitol	Pyridoxine
134	1	Ascorbic acid participates in reactions of:	Hydroxylation	dexarboxylation	redox	Acyl transfer	dexarboxylation
135	1	The coenzyme form of vitamin pantotenic acid is:	Coenzyme A	retinal	flavin mononucleotide	Tetrarahydrofolic acid	Pyridoxal phosphate

136	1	What vitamin is precursor of tetrahydrofolic acid?	Vitamin Bc	Vitamin B2	Vitamin B6	Vitamin C	Vitamin D
137	1	Most of hydrogen atoms (protons and electrons) involved in process of tissue respiration are transported to the respiratory chain by the next compound:	NADH+H+	NADPH+H+	FMNH2	FADH2	Pyruvate
138	1	In a patient painfulness along a great nerv truncs is observed as well as increase of pyruvate in blood. Insuficiency of what vitamin may induce these symptoms?	Vitamin B1	Vitamin C	Vitamin B6	Vitamin K	Vitamin PP
139	1	In case of enterobiasis acrihine – the structural analogue of vitamin B2 - is administered. The synthesis disorder of which enzymes does this medicine cause in microorganisms?	FAD-dependent dehydrogenases	Cytochromeoxidases	Peptidases	NAD-dependet dehydrogenases	Aminotransferases
140	1	According to the clinical signs, pyridoxal phosphate was prescribed to a patient. For the correction of what biochemical processes is this drug recommended?	Transamination and decarboxylation of amino acids.	Synthesis of purines and pyrimidines.	Oxidative decarboxylation of ketoacids.	Deamination of amino acids.	Protein synthesis.
141	1	Malignant hyperchrome anemia, or Birmer's disease, is a pathological state caused by the deficiency of vitamin B12. What chemical element is a constituent of the structure of this vitamin?	Cobalt..	Molybdenum.	Zinc.	Iron.	Magnesium.
142	1	For diagnostics of certain illnesses the determination of blood transaminases activity is required. Which vitamin is a component of the cofactors of the enzymes?	B6.	B12.	B3.	B8.	B5.
143	1	Biochemical functions of water soluble vitamins are realized due to their transformation to coenzymes. What coenzyme is formed by vitamin PP?	NAD (nicotinamide adenine dinucleotide)	FAD (flavin adenine dinucleotide)	Pyridoxalphosphate	FMN (flavinmononucleotide)	Thiamine pyrophosphate

144	1	Which of the following symptoms would be seen in a patient with a severe deficiency of thiamine?	A decreased level of transketolase activity in red blood cells	An increased clotting time of blood	A low level of cell transaminase activity	Xerophthalmia	A decrease in blood level of pyruvate and lactate
145	1	Pantothenic acid is a precursor of the next coenzyme:	Coenzyme A	FAD	NADP	Coenzyme Q	SAM (S-adenosylmethionine)
146	1	Thiamine pyrophosphate is a cofactor of which of the following enzymes?	Pyruvate dehydrogenase complex	Aminotransferase	Citrate synthase	Arginase	Succinate dehydrogenase
147	1	Para-aminobenzoic acid is believed to be an inhibitor in biosynthesis of the next vitamin in bacteria:	Folic acid	Biotin	Pantothenic acid	Cobalamin	Pyridoxine
148	1	One-carbone group transfer reaction are catalyzed by enzymes, which coenzyme is	Tetrarahydrofolic acid	retinal	Coenzyme A	flavin mononucleotide	Pyridoxal phosphate
149	1	In blood of a patient an increased concentration of pyruvate is detected .as well as significant quantities of this substance in urine. What avitaminosis was developed in a patient?	B1 avitaminosis	B6 avitaminosis	B2 avitaminosis	D avitaminosis	C avitaminosis
150	1	Lipoic acid is a cofactor of the next enzyme complex:	Pyruvate dehydrogenase	Lactate dehydrogenase	Cytochrome oxidase	Succinate dehydrogenase	ransketolase
151	1	Hydroxylation of endogenous substrates and xenobiotics requires a donor of protons. Which of the following vitamins can play this role?	Vitamin C	Vitamin P	Vitamin B6	Vitamin E	Vitamin A

152	1	The precursor of CoA is:	Pantothenate	Riboflavin	Pyridoxamine	Thiamin	Biotin
153	1	A child manifests epileptic seizures caused by vitamin B6 deficiency. This is conditioned by the decrease of the 7-aminobutyrate level in the nervous tissue which acts as an inhibiting neurotransmitter. The activity of which enzyme is decreased in this case?	Alanine aminotransferase.	Pyridoxal kinase.	Glutamate dehydrogenase.	Glutamate decarboxylase.	Glutamate synthetase
154	1	There is an increase of the pyruvate level in the patient's blood and urine. What kind of avitaminosis developed in this case?	B1 avitaminosis.	E avitaminosis.	B3 avitaminosis.	B2 avitaminosis.	B12 avitaminosis.
155	1	A chronic alcoholic develops severe memory loss with marked confabulation. Deficiency of which of the following vitamins would be most likely to contribute to the neurologic damage underlying these symptoms?	Thiamine	Folic acid	Niacin	Riboflavin	Vitamin B12
156	1	To a patient suffering from tuberculosis isoniazide was adminitered. Some time later he coplaits on general weakness, disorders of vision, coordination. Application of what vitamin may be usefull for elimination of noted side effects?	Vitamin B6	Vitamin B2	Vitamin C	Vitamin A	Vitamin D
157	1	The example of a hydrogen transferring coenzyme is:	NADP+	B6-PO4	TPP	ATP	CoA
158	1	Vitamin B12 has a complex ring structure (corrin ring) consisting of four:	Pyrrole rings	Purine rings	Pyrimidine rings	Pteridine rings	

159	1	The following substance is involved in biosynthesis of NAD:	Adenine	Flavine	Ribitol	Pyridoxine	Deoxyribose
160	1	A patient was admitted into hospital with a diagnosis diabetes mellitus type I. In metabolic changes the decrease of oxaloacetate synthesis rate is detected What metabolic passway is damaged as a result?	Tricarboxylic acid cycle	Glycolysis	Cholesterol biosynthesis	Glycogen mobilization	Urea synthesis
161	1	Substrate phosphorylation is a process of phosphate residue transfer from macroergic donor substance to ADP or some other nucleoside diphosphate. What enzyme of tricarboxylic acid cycle participates in reaction of substrate phosphorylation.	Succinyl thiokinase	Citrate synthase	Succinate dehydrogenase	Fumarase	Alpha-ketoglutarate dehydrogenase complex
162	1	Before pyruvic acid enters the TCA cycle it must be converted to:	Acetyl CoA	Citrate	Lactate	α-ketoglutarate	Succinate
163	1	The formation of citrate from oxaloacetate and acetyl CoA in TCA is:	Condensation	Oxidation	Reduction	Hydrolysis	Isomerisation
164	1	The number of molecules of ATP produced by the total oxidation of acetyl CoA in TCA cycle is:	12	6	8	10	15
165	1	The positive allosteric modifier of the enzyme pyruvate carboxylase?	Acetyl CoA	Biotin	Oxaloacetate	ATP	ADP

166	1	Most of the metabolic pathways are either anabolic or catabolic. Which of the following pathways is considered as “amphibolic” in nature?	TCA cycle	Glycogenesis	Glycolytic pathway	Lipolysis	Pentosophosphate pathway
167	1	The next principal substrate is involved into oxidation in tricarboxylic acid cycle:	Acetyl-CoA	Glucose	Pyruvate	Lactate	Glutamate
168	1	Mitochondria are subcellular organelles and are present in a cytoplasm of every cell exept mature red blood cells, bacteria, blue-green algae. What method is used principally for their isolation?	Differential centrifugation	Gel-filtration	Chromatography	Electrophoresis	Spectrophotometry
169	1	Tricarboxylic acid cycle to be continuous requires the regeneration of:	Oxaloacetic acid	Pyruvic acid	α-oxoglutaric acid	Malic acid	Succinic acid
170	1	Malate dehydrogenase is an enzyme dependent from the presence of the next cofactor:	NAD^+	TPP	Coenzyme A	NADP	FMN
171	1	Which from listed below substances is used as an inhibitor in studies of TCA cycle functioning?	Malonate	ATP	NAD	Aconitate	Isocitrate
172	1	The oxidation-reduction system having the highest redox potential is:	NAD+/NADH	Ubiquinone ox/red	Fe3+ cytochrome a/Fe2+	Fe3+ cytochrome b/Fe2+	E. Fe3+ cytochrome c1/Fe2+
173	1	The process of metabolism in the human body produces active forms of oxygen, including superoxide anion radical. This anion is inactivated by the following enzyme:	Superoxide dismutase	Catalase	Peroxidase	Glutathione peroxidase	Glutathione reductase

174	1	Those organisms which in the process of evolution failed to develop protection from H2O2 can exist only in anaerobic conditions. Which of the following enzymes can break hydrogen peroxide down?	Peroxidase and catalase	Oxygenase and hydroxylase	Cytochrome oxidase, cytochrome B5	Oxygenase and catalase	Flavin-dependent oxidase
175	1	Cyanide is a poison that causes instant death of the organism. What enzymes found in mitochondria are affected by cyanide?	Cytochrome oxidase (aa3)	Flavin enzymes	Cytochrome b5	NAD+-dependent dehydrogenase	Cytochrome P-450
176	1	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
177	1	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
178	1	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
179	1	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
180	1	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	Formylkynurenine (Arylformamidase)	Kynurenine 3-hydroxylase

181	1	It is known that some chemical compounds uncouple the tissue respiration and oxidative phosphorylation. Name one of these compounds:	2,4-dinitrophenol	Carbon monoxide	Antimycin A	Lactic acid	Acetyl-CoA
182	1	In the complex treatment of periodontitis, tocopherol was used. What effect causes the healing properties of this vitamin?	Antioxidant	Antiphlogistic	Antialergic	Osteotropic	Prooxydant
183	1	There are various diseases that cause sharp increase of active oxygen, leading to cell membranes destruction. Antioxidants are used to prevent it from happening. The most potent natural antioxidant is:	Alpha-tocopherol	Glucose	Vitamin D	Fatty acids	Glycerol
184	1	In the process of metabolism human body produces active oxygen forms, including superoxide anion radical O2. This anion is inactivated by the following enzyme:	Superoxide dismutase	Catalase	Peroxidase	Glutathione peroxidase	Glutathione reductase
185	1	Newborn children have a special brown adipose tissue, in which fuel oxidation serves not to produce ATP, but to generate heat to keep the newborn warm. Which substance from this tissue serves as a natural uncoupler of oxidative phosphorylation?	Thermogenin	Rothenon	Cyanide	Hydrogen sulfide	Thyroxin
186	1	Uncoupling of respiration from oxidative phosphorylation assumes biological significance in brown adipose tissue of newborns. Which natural uncoupler is located in this tissue?	Thermogenin	Rothenon	Cyanide	Hydrogen sulfide	Thyroxin
187	1	Redox potential (EO volts) of NAD+/NADH is:	–0.32	–0.67	–0.12	+0.03	–0.88

188	1	The correct sequence of cytochrome carriers in respiratory chain is:	Cyt b→cyt c1→cyt c→cyt aa3	Cyt b→cyt c→cyt c1→cyt aa3	Cyt aa3→ cyt b→cyt c→cyt c1	Cyt b→cyt aa3→cyt c→ cyt c	Cyt aa3→ cyt c1→cyt c→ cyt b
189	1	All of the following electron carriers are components of the mitochondrial electron transport chain EXEPT:	NADP+	NAD	FMN	FAD	Coenzyme Q10
190	1	Cytochrome c of mitochondrial respiratory chain transfers electrons:	To cytochrome oxidase	From FAD-H2	From NADP-H2	From ubiquinon	To cytochrome b2
191	1	A component of the respiratory chain in mitochondria is:	Coenzyme Q	Coenzyme containing thiamine	Coenzyme A	Acetyl coenzyme	Coenzyme B
192	1	Peroxidase belongs to the next class of enzymes:	Oxido-reductases	Transferases	Hydrolases	Lyases	Isomerases
193	1	The redox carriers are grouped into respiratory chain complex:	In the inner mitochondrial membrane	Cytosol	In mitochondiral matrix	On the outer mitochondrial membrane	On the inner surface of outer mitochondrial membrane
194	1	If the reducing equivalents enter from NAD in the respiratory chain, the phosphate:oxygen ration (P:O) is:	3	1	2	4	5

195	1	Reducing equivalents from succinate enter the mitochondrial respiratory chain at:	FAD	Cyt c	Coenzyme Q	NAD	Cyt b
196	1	ATP synthesis is totaly blocked in a cell. How will the value of membrane rest potential change?	It will disappear	First it will increase, then decrease	It will be considerably increased	It will be slightly increased	First it will decrease, then increase
197	1	An enzyme catalyzing oxidoreduction, using oxygen as hydrogen acceptor is:	Cytochrome oxidase	Lactate dehydrogenase	Malate dehydrogenase	Succinate dehydrogenase	Fumarase
198	1	Which of the following enzymes is tightly associated with inner mitochondrial membrane?	Succinate dehydrogenase	Citrate synthase	Alpha-ketoglutarate dehydrogenase	Fumarase	Malate dehydrogenase
199	1	Most of hydrogen atoms (protons and electrons) involved in process of tissue respiration are transported to the respiratory chain by the next compound:	NADH+H+	NADPH+H+	FMNH2	FADH2	Pyruvate
200	1	Some of the free energy released in the mitochondrial electron transport chain can be harnessed to the formation of ATP. How many moles of ATP can be formed per a pair of electrons transferred from reduced FAD to oxygen?	2	0	1	3	4
201	1	The oxidation-reduction system having the lowest redox potential is:	Fe3+ cytochrome a/Fe2+	Fe3+ cytochrome c1/Fe2+	Ubiquinone ox/red	Fe3+ cytochrome b/Fe2+	NAD+/NADH

202	1	The sequence of the redox carriers in respiratory chain is:	NAD→FMN→CoQ→cyt b→cyt c1→cyt c→cytaa3 → O2	FMN→CoQ →NAD→cyt b→cyt aa3→cyt c1→cyt c → O2	NAD→FMN→CoQ → cyt c1→cyt c→cyt b→cytaa3 → O2	NAD→FMN→ CoQ→cyt b→ cyt aa3 cyt c1→cyt	FMN→NAD → CoQ→cyt b→ cyt aa3 cyt c1→cyt
203	1	Most of protons and electrons which are further involved into mitochondrial respiratory chain are supplied from the next metabolic pathways:	Tricarboxylic acid (TCA) cycle	Glycolysis	Pyruvate dehydrogenase complex	Cleavage of proteins	Oxidation of fatty acids
204	1	Enzymes of respiratory chain perform oxidation of substrates and transfer of reductive equivalents to oxygen with production of water molecules. Where they are located?	On inner mitochondrial membrane.	On cytoplasmic membrane	In cytoplasm	On outer mitochondrial membrane	In nucleus
205	1	The component of respiratory chain enzymes cytochrome oxidase (cytochrome a+a3), operates as a transporter of:	Electrons	Cations	Protons	Anions	Hydrogen
206	1	The next enzyme complex serves as a point of entry for most of the electrons generated by the action of the citric acid cycle:.	Complex I	Complex II	Complex III	Complex IY	ATP synthase
207	1	Cytochrome oxidase is an enzyme of respiratory chain with the next characteristics:	Contains copper ions	Trasfers electrons to cytochrome c	Is not inhibited by cyanides	Contains two iron sulfur centers	Is a simple protein
208	1	Brown adipose tissue is:	Characterised by high content of mitochondria	A prominent tissue in human	Associated with high activity of ATP synthase	Characterised by low content of cytochromes	TCA doesn’t occur here

209	1	Dehydrogenases utilize, as coenzymes, all of the following except:	FH4	NAD+	NADP+	FAD	FMN
210	1	What reaction conditions are needed for oxidation of pyrocatechin by molecular oxygen in presence of phenoloxidase and production of oxidation products with brown color?	In presence of pyrocatechin and potatoe juice	After boiling of potatoe juice	Absence of pyrocatechin	In presence of Na2S	In strong acidic medium
211	1	Which of the following actions describes the uncoupling of oxidative phosphorylation in a mitochondrial system?	The phosphorylation of ADP stops but oxygen uptake continues	The phosphorylation of ADP to ATP accelerates	The phosphorylation of ADP continues but oxygen uptake stops	Oxygen uptake stops	Produced ATP is not translocated across inner membrane to cytoplasm
212	1	Dehydrogenases are enzymes which catalyze transfer of the next structural elements of the molecule:	Hydrogen	Phosphate group	Methyl group	Amino group	Oxygen anion
213	1	Which from the respiratory chain enzymes needs FAD as coenzyme?	Succinate dehydrogenase	NAD H2-ubiquinone reductase	Ubiquinone-cytochrome c reductase	Cytochrome oxidase	Complex 3 enzymes
214	1	Some hormones are acting as uncouplers of oxidative phosphorylation. Chose from listed below hormones one which is considered as the best uncoupler.	Thyroxine	Norepinephrine	Testosterone	Insulin	Cortisol
215	1	The next process occurs in suspension of mitochondria with ruptured inner membrane and provided with malate and oxygen	Transport of electrons along enzymes of respiratory chain	Phosphorylation of ADP	Decrease of pH in the external medium	Increase of pH in mitochondrial matrix	Oxydative phosphorylation will take place

216	1	The chemical inhibiting oxidative phosphorylation, a dependent on the transport of adenine nucleotides across the inner mitochondrial membrane is:	Oligomycin	Atractyloside	Dinitrophenol	Pentachlorophenol	
217	1	Activity of cytochrome oxidase is inhibited by:	Cyanide	Sulphite	Sulphate	Arsenite	Chloride
218	1	During the necropsy of a 20-year-old girl a pathologist concluded that the death of the patient had resulted from poisoning by cyanides. The activity of what enzyme is mostly inhibited by cyanides?	Cytochrome oxydase	Malate dehydrogenase	Heme synthase	Aspartate aminotransferase	Lactate dehydrogenase
219	1	Note a compound which is considered as natural uncoupler of oxidative phosphorylation	Thermogenin	Progesteron	Succinic acid	Sapogenin	Stearic acid
220	1	Chemiosmotic theory for oxidative phosphorylation has been proposed by:	P. Mitchell	Chance and Williams	Pauling and Corey	S. Waugh	H. Krebs
221	1	ATP synthetase is a multichain enzyme complex with the next characteristic features:	It possess ion selective channel which selectively conduct protons	Cyanides inhibit its enzymatic activity irreversibly	It contains four iron-sulfur centers	It is integral membrane protein associated with outer membrane of mitochondria	It is inhibited by high concentration of ADP and inorganic phosphate
222	1	Reactive oxygen species (ROS) include the next substances EXEPT:	Hydrogen ions	Hydrogen peroxide	Superoxide anion	Hydroxyl radical	Organic hydroperoxides

223	1	Hydrogen peroxide is harmful and extremely toxic to living cells. Chose an enzyme which is used by cells for neutralization of hydrogen peroxide:	Glutathion peroxidase	Cytochrome oxidase	NADP-H2-oxidase	Cyclooxygenase	Monoamine oxidase
224	1	Superoxide anion is generated in course of tissue respiration and is a strong oxidant, possessing a harmful effect. What enzyme is involved in neutralization of this compound?	Superoxide dismutase	Xanthine oxidase	Monoamine oxidase	Peroxidase	Catalase
225	1	CO is extremely dangerous poison as it irreversibly blocks repiratory chain of enzymes. At which point is arrested electron transport in presence of CO?	Cytochrome oxidase	NADH2-ubiquinon reductase	Succinate dehydrogenase	Ubiquinon-cytochrome c reductase	Respiratory complex III
226	1	The production of thyroid hormones is stimulated under thyrotoxicosis. It leads to body weigh loss, tachycardia, and rise of psychic irritability. Choose the biochemical mechanism by which thyroid hormones affect the tissue bioenergetics from the listed below:	Uncoupling of oxidation and oxidative phosphorylation	Blockage of mitochondrial respiratory chain	Activation of substrate level phosphorylation	Blockage of substrate level phosphorylation	Activation of oxidation and oxidative phosphorylation
227	1	Rotenone inhibits the respiratory chain at:	FMN → coenzyme Q	NAD → FMN	Coenzyme Q → cyt b	Cyt b → Cyt c1	Cyt c1→Cyt a3
228	1	Substrate level phosphorylation is seen in association with	Succinate thiokinase	Succinate dehydrgenase	Alpha ketogluterate dehydrogenase	Malanate dehydrogenase	Cis-aconitase
229	1	Transfer of reducing equivalents from NADH to coenzyme Q is specifically inhibited by:	Piericidin A	Carboxin	Oligomycin	H_2S	Theroxine

230	1	Activation of membrane lipid peroxydation is one of the basic mechanisms of membrane structure and functions damage as well as the death of a cell. The cause of this pathology is:	Vitamin E deficiency	B12-hypervitaminosis	B1-deficiency	B1-hypervitaminosis	B12-deficiency
231	1	Catalase is an enzyme with the next properties:	It catalyses the decomposition of hydrogen peroxide with formation of water and oxygen as products	It reduces hydrogen peroxide using substances providing hydrogen atoms with formation of water and oxidized substance	Catalyses interaction of CO2 and water and produce oxygen and formaldehyde as final products.	Contains FMN as coenzyme	It is NAD-dependent enzyme
232	1	Cyanides are extremely dangerous poisons as they irreversibly block repiratory chain of enzymes. At which point is arrested electron transport in presence of cyanides?	Cytochrome oxidase	NADH2-ubiquinon reductase	Succinate dehydrogenase	Ubiquinon-cytochrome c reductase	Respiratory complex III enzymes
233	1	An enzyme catalyzing oxidoreduction, using oxygen as hydrogen acceptor is:	Cytochrome oxidase	Lactate dehydrogenase	Malate dehydrogenase	Succinate dehydrogenase	Fumarase
234	1	Some hormones are acting as uncouplers of oxidative phosphorylation. Chose from listed below hormones one considered as potent uncoupler.	Thyroxine	Norepinephrine	Testosterone	Insulin	Cortisol
235	1	Chose a toxic substance acting as potent uncoupler of oxidative phosphorylation:	Dinitrophenol	Phenol	Picric acid	Sodium cyanide	Heme

236	1	Catalase represents the next class of enzymes:	Oxidoreductases	Transferases	Hydrolases	Lyases	Isomerases
237	1	The driving force for ATP synthesis in mitochondria is created due to:	Asymmetric distribution of protons across inner mitochondrial membrane	Transport of electrons along the chain of cytochromes	Reduction of oxygen and production of water with free energy release	Generation of high energy intermediates during electron transport	Difference in electric charge between inner and outer mitochondrial membranes
238	1	The chemiosmotic hypothesis of oxidative phosphorylation suggests that ATP is formed because:	Formation of proton gradient across the inner membrane	The change in the permeability of inner mitochondrial membrane toward ADP and inorganic phosphate	Due to formation of high energy bonds in mitochondrial proteins	ADP is pumped out of the matrix into the intermembrane space	Protons are pumped into the mitochondrial matrix
239	1	ATP synthetase is a multichain enzyme complex with the next characteristic features:	It possess ion selective channel which selectively conduct protons	It is inhibited by high concentration of ADP and inorganic phosphate	It contains four iron-sulfur centers	It is integral membrane protein associated with outer membrane of mitochondria	Cyanides inhibit its enzymatic activity irreversibly
240	1	Profuse foam appeared when dentist put hydrogen peroxide on the mucous of the oral cavity. What enzyme caused such activity?	Catalase	Cholinesterase	Acetyltransferase	Glucose-6-phosphate-dehydrogenase	Methemoglobinreductase
241	1	Cychrome aa3 belongs to the next class of enzymes:	Oxido-reductases	Transferases	Hydrolases	Lyases	Isomerases

242	1	High resistance of “winter-swimmers” (so-called “walruses”) to low temperatures is explained by increased production of certain hormones that stimulate the processes of biological oxidation and heat formation in the cells through the uncoupling of mitochondrial electron transfer and the oxidative phosphorylation. Choose the name of these hormones:	Thyroin hormones	Glucagone	Adrenaline	Insulin	Corticosteroids
244	1	Uncouplers of oxidative phosphorylation are acting as follows:	Collapse proton gradient across outer mitochondrial membrane	Allow electron transport to proceed and block ATP synthesis	Arrest electron transport and ATP synthesis simultaneously	Competitively inhibit FMN-dependent ubiquinone reductase	Inhibit the electron transport in cytochromes chain
245	1	Infant death occurs due to cyanide poisoning. What is the biochemical mechanism of cyanides’ unfavorable action on the molecular level?	Inhibition of cytochrome oxidase	Chemical bounding to the substrates of TCA	Blockage of succinate dehydrogenase	Inactivation of oxygen molecule	Inhibition of cytochrome b
246	1	α-Ketoglutarate dehydrogenase complex contains derivatives of the following vitamins:	Thiamine	Folic acid	Retinol	Pyridoxine	Ubiquinone
247	1	Which of the following substances activate isocitrate dehydrogenase	ADP	$FADH_2$	$NADH+H^+$	ATP	Mg^{2+}
248	1	Tricarboxylic acid cycle (TCA) generates reduced forms of NAD and FAD which are used in:	Respiratory chain of enzymes in mitochondria	Synthesis of fatty acids	Biosynthesis of ATP by substrate phosphorylation	Biosynthesis of ATP by oxidative phosphorylation	Biosynthesis of purine nucleotides

249	1	Which of the following compounds would you expect to liberate the least free energy on hydrolysis?	AMP	ATP	ADP	Phosphoenolpyruvate	Phosphocreatine
250	1	Which of the following enzymes catalyze convetion of succinate to fumarate:	Succinate dehydrogenase	Fumarase	Aconitase	Citrate synthase	Isocitrate dehydrogenase
251	1	How many moles of $NADH+H^+$ are produced in process of oxidation of 0,25 mole of acetyl-CoA in tricarboxylic acid cycle?	0,75	0,25	0,1	0,5	1,0
252	1	A specific inhibitor for succinate dehydrogenase is:	Malonate	Succinate	Aconitate	Citrate	Cyanide
253	1	How many moles of $FADH_2$ are produced in process of oxidation of 0,25 mole of acetyl-CoA in tricarboxylic acid cycle?	0,25	0,1	0,5	1,0	1,5
254	1	The number of molecules of ATP produced by the total oxidation of acetyl CoA in TCA cycle is:	12	6	8	10	14
255	1	Which of the following compounds would you expect to liberate the highest free energy on hydrolysis?	Phosphoenolpyruvate	ATP	ADP	AMP	Phosphocreatine

256	1	In a patient are manifested symptoms of intoxication with arsenic compounds. What metabolic process is damaged taking into account that arsen containing substances inactivate lipoic acid.	Oxidative decarboxylation of α-ketoglutarate.	Neutralization of superoxide anions	Coupling of oxidation and phopsphorylation	Microsomal oxidation	Fatty acids biosynthesis
257	1	Out of 24 mols of ATP formed in TCA cycle, 2 molecules of ATP can be formed at "substrate level" by which of the following reaction?	Succinyl-CoA→Succinic acid	Citric acid → Isocitric acid	Isocitrate→Oxaloacetate	Succinic acid→Fumarate	Fumarate→Malate
268	1	Which of the following enzymes catalyze reaction: *Acetyl-CoA + oxaloacetate → citrate + CoASH:*	Citrate synthase	Succinate dehydrogenase	Fumarase	Aconitase	Isocitrate dehydrogenase
269	1	Which of the following statements regarding TCA cycle is true?	It is amphibolic in nature	It is an anaerobic process	It occurs in cytosol	It contains no intermediates for gluconeogenesis	It occurs in nucleus
270	1	Citrate is converted to isocitrate by aconitase which contains:	Fe^{2+}	Ca^{2+}	Zn^{2+}	Mg^{2+}	Mn^{2+}
271	1	An aneplerotic reaction which sustains the availability of oxaloacetate is the carboxylation of:	Pyruvate	Glutamate	Aconitate	Citrate	Succinate
272	1	An allosteric enzyme responsible for controlling the rate of TCA cycle is:	Isocitrate dehydrogenase	Malate dehydrogenase	Succinate dehydrogenase	Fumarase	Aconitase

273	1	Cellular proteins destined for secretion are stored and packaged in the:	Endoplasmic reticulum	Lysosomes	Endosomes	Goldgi network	Peroxisomes
274	1	Human red blood cells contain no mitochondria. What is the main pathway for ATP production in these cells?	Anaerobic glycolysis	Oxidative phosphorylation	Aerobic glycolysis	Creatinekinase reaction	Cyclase reaction
275	1	Glycolysis proceeds in:	Cytoplasm of every living cell	Cytoplasm of red blood cell only	Mitochondria of striated muscle cell	Nuclei of liver cells	Lysosomal vesicles
276	1	Untrained people often have muscle pain after sprints as a result of lactate accumulation. This can be caused by intensification of the following biochemical process:	Glycolysis	Lipogenesis	Pentosephosphate pathway	Gluconeogenesis	Glycogenesis
277	1	A 7-year-old girl manifests obvious signs of anemia. Laboratory tests showed the deficiency of pyruvate kinase activity in erythrocytes. The disorder of what biochemical process is a major factor in the development of anemia?	Anaerobic glycolysis	Deamination of amino acids	Tissue respiration	Oxidative phosphrylation	Breaking up of peroxides
278	1	In glycolysis ATP is produced by the process of:	Substrate phosphorylation	Oxidative phosphorylation	Photosynthetic phosphorylation	Transfer of phosphate group from fructose-bisphosphate upon ADP	Deamination of amino acids
279	1	Lactate dehydrogenase is an oligomeric molecule which contains the next number of subunits:	Four	Three	Two	Six	Eight

280	1	Which of the following statements about the glycolytic intermediate, fructose-6-phosphate is correct?	In glycolysis fructose-6-phosphate is an aldol but is not itself split by the aldol reaction until phosphorylated to fructose-1:6-bisphosphate.	In glycolysis fructose-6-phosphate is converted to glucose-6-phosphate and can then be split by the aldol reaction into an aldehyde and a ketone.	In glycolysis fructose-6-phosphate is an aldol so once phosphorylated to fructose-1:6-bisphosphate cannot be split by the aldol reaction into an aldehyde and a ketone.	In glycolysis fructose-6-phosphate is formed from glucose-6-phosphate and is split by the aldol reaction into an aldehyde and a ketone.	-
281	1	Glucokinase can be characterized by one of the next statements:	It has a much higher Michaelis constant (Km) for glucose than does hexokinase	ATP is activator of this enzyme	The reaction that this enzyme catalyses produces a high energy phosphate	It is the major regulatory enzyme of glycolysis	It is located in mitochondria
282	1	Pasteur effect is:	Inhibition of anaerobic glycolysis	Inhibition of enzyme phosphofructokinase	Activation of lactate synthesis	Oxygen is not involved	All of these
283	1	One mole of glucose in glycolytic pathway in anaerobic conditions produces:	Two moles of lactate	Three moles of lactate	Four moles of lactate	One moles of lactate	Five moles of lactate
284	1	Conversion of glucose to glucose-6-phosphate in human liver is by:	Glucokinase only	Hexokinase and glucokinase	Glucophosphatase	Glucose-6-phosphate dehydrogenase	Hexokinase only

285	1	Which of the following enzyme-catalysed reactions has a product containing a newly formed high energy phosphate bond?	2-Phosphoglycerate to phosphoenolpyruvate	3-Phosphoglycerate to 2-phosphoglycerate	The phosphorylation of glucose	Dihydroxyacetone phosphate to glyceraldehydes phosphate	Fructose-1,6-bisphosphate to glyceral-dehydes-3-phosphate and dihydroxyacetone phosphate
286	1	The following is an enzyme required for glycolysis:	Pyruvate kinase	Pyruvate dehydrogenase	Pyruvate carboxylase	Glucose-6-phosphatose	Glycerokinase
287	1	As a result of anaerobic glycolysis glucose is converted to:	Lactic acid	Citric acid	Glycogen	Succinic acid	Acetoacetic acid
288	1	Chose the correct statement of phosphofructokinase properties:	AMP is an activator of this enzyme	The reaction that this enzyme catalyzes produces a high energy phosphate bond without the involvement of ADP or ATP	It is not regulatory enzyme of glycolysis	The substrate of this enzyme is glucose-6-phosphate	This enzyme catalyzes the interconversion of dihydroxyacetone phosphate and glyceraldehydes-3-phosphate
289	1	Alcoholic fermentation occurs in yeast and several bacterial species. In this process product of pyruvate decarboxylation is:	Acetaldehyde	Ethanol	Lactate	Phosphoenolpyruvate	Glucose
290	1	Which of the following is a substrate for aldolase activity in glycolytic pathway?	Fructose-1,6-bisphosphate	Glucose-1,6-bisphosphate	Glucose-6-phosphate	Fructose-6-phosphate	Glyceraldehyde-3-phosphate

291	1	The oxidation of lactic acid to pyruvic acid requires the following vitamin derivative as the hydrogen carrier:	NAD+	FAD	FMN	Coenzyme A	Lithium pyrophosphate
292	1	During consumption of cakes or sweets in mixed saliva a transient increase in lactate level takes place. Activation of what biochemical process causes this effect?	Anaerobic glycolysis	Tissue respiration	Aerobic glycolysis	Gluconeogenesis	Microsomal oxidation
293	1	Glycolysis is also referred to as:	Embden-Meyerhof-Parnas pathway	Lineweaver-Burk pathway	Krebs-Henseleit pathway	Chargaff pathway	Watson-Crick pathway
294	1	The combination of subunits in lactate dehydrogenase molecule makes it possible to create the next number of isoenzymes:	Five	Four	Six	Three	Eight
295	1	Red blood cells for proper function need energy in form of ATP. What process provides the red blood cell with required amount of ATP?	Anaerobic glycolysis	Aerobic oxidation of glucose	Tricarboxylic acid cycle	β-oxidation of fatty acids	Pentosophosphate pathway
296	1	An untrained person who has not been practicing physical exercises for a long time complains of a muscle pain as a result of intensive manual work. What is the probable reason of the pain syndrome?	Accumulation of lactate in muscles	Increased disintegration of muscle proteins	Increase of ATP level in muscles	Decreasing of lipids level in muscles	Accumulation of creatinine in muscles
297	1	Which of the following enzymes is not involved in glycolysis:	Glucose oxidase	Glucokinase	Hexokinase	Aldolase	Enolase

298	1	Anaerobic oxidation of glucose to lactate is regulated by appropriate enzymes. What enzyme is the major regulator of this process?	Phosphofructokinase	Enolase	Glucose-6-phosphate isomerase	Lactate dehydrogenase	Aldolase
299	1	During glycolysis fructose-1,6-bisphosphate is decomposed by the enzyme:	Aldolase	Hexokinase	Enolase	Fructokinase	Disphosphofructophosphatase
300	1	Which mammalian cell does not have aerobic pathway of glucose catabolism?	Red blood cell	Nerve cell	Sperm cell	Ovum	Liver cell
301	1	The irreversible reactions of glycolysis include that catalyzed by:	Phosphofructokinase	Phosphohexose isomerase	Fructose-bisphosphate aldolase	Glyceraldehyde-3-phosphate dehydrogenase	Phosphoglycerate kinase
302	1	In yeast cells occurs a process which is similar to glycolysis – alcohol fermentation. In course of this process through several stages from pyruvate is produced:	Ethanol	Acetaldehyde	Lactate	Pyruvate	Glyceraldehyde
303	1	It has been determined that one of a pesticide components is sodium arsenate that blocks lipoic acid. Enzyme activity can be impaired by this pesticide. Name this enzyme:	Pyruvate dehydrogenase complex	Microsomal oxidation	Methemoglobin reductase	Glutathione peroxidase	Glutathione reductase
304	1	Galactosemia- a genetic disorder, results in liver damage, cataract and severe mental retardation. Which enzyme deficiency takes place?	Galactose-1-phosphate urydiltransferase	Galactokinase	Hexokinase	UDP-glucose-4-epimerase	pyruvate kinase

305	1	A patient, who has been subsisting exclusively on polished rice, has developed polyneuritis due to thiamine deficiency. What substance is an indicator of such avitaminosis, when it is excreted with urine?	Pyruvic acid	Phenyl pyruvate	Uric acid	Methylmalonic acid	Malate
306	1	The following enzyme is required for the hexose monophosphate shunt pathway:	Glucose-6-phosphate dehydrogenase	Glucose-6-phosphatase	Phosphorylase	Phosphofructokinase	Aldolase
307	1	When blood circulation in the damaged tissue is restored, lactate accumulation stops and glucose consumption decelerates. These metabolic changes are caused by activation of the following process:	Aerobic glycolysis	Anaerobic glycolysis	Lipolysis	Gluconeogenesis	Glycogen biosynthesis
308	1	Pyruvate dehydrogenase complex and α-ketoglutarate dehydrogenase complex require the following for their oxidative decarboxylation:	CoASH, TPP,NAD+,FAD, Lipoamide	CoASH and lipoic acid	NAD+ and FAD	CoASH and TPP	TPP
309	1	Fructosuria is known to be connected with inherited deficiency of fructose 1phosphate aldolase. What product of fructose metabolism will accumulate in the organism resulting in toxic action?	Fructose 1-phosphate	Fructose 1,6-biphosphate	Fructose 6-phosphate	Glucose 1-phosphate	Glucose 6-phosphate
310	1	Biosynthesis of the purine ring occurs owing to ribose-5-phosphate by gradual joining of nitrogen and carbon atoms inside the heterocycle structure and closing of the rings. The metabolic source of ribose-5-phosphate is:	Pentose phosphate pathway	Glycolysis	Gluconeogenesis	Glycogenosis	Glycogenolysis

311	1	A newborn develops dyspepsia after the milk feeding. When the milk is substituted by the glucose solution the dyspepsia symptoms disappear. The newborn has the subnormal activity of the following enzyme:	Lactase	Maltase	Invertase	Isomaltase	Amylase
312	1	Ribulose 5 phosphate (RU5P) is converted to ribose 5 phosphate (R5P) by the enzyme?	Ribose-5-phosphate ketoisomerase	Ribose 5 phosphate dehydrogenase	Ribulose 5 phosphate dehydrogenase	Ribulose-5-phosphate ketoisomerase	Aldolase
313	1	Galactose is phosphorylated by galactokinase to form:	Galactose-1-phosphate	Galactose-6-phosphate	Galactose-1,6-diphosphate	Glucose-6-phosphate	All of these
314	1	The intake of aspirin by a 3-year-old child with a fever caused marked erythrocytes hemolysis. The inherited deficiency of what enzyme could be the cause of the hemolytic anemia development?	Glucoso-6-phosphate dehydrogenase	Glycerol-phosphate dehydrogenase	Glycogen phosphorylase	Glucose-6-phosphatase	γ-Glutaminyl transferase
315	1	Individuals who eat fresh fava beans are protected to a certain extent from malaria. Which enzyme deficiency takes place under these conditions?	Glucose-6-phosphate dehydrogenase	Transketoase	Pyruvate dehydrogenase	Ribulosephoshate isomerase	Transaldolase
316	1	The pentose phosphate pathway sometimes referred to as:	Hexose monophosphate shunt	Hexose bisphosphate shunt	Embden-Meyerhof-Parnas pathway	Chargaff pathway	Krebs-Henseleit pathway
317	1	Lipoic acid is a cofactor of the next enzyme complex:	Pyruvate dehydrogenase	Succinate dehydrogenase	Lactate dehydrogenase	Cytochrome oxidase	Transketolase

318	1	Pyruvate decarboxylase (one of enzymes of pyruvate dehydrogenase complex) contains as coenzyme:	Thiamine pyrophopsphate	Ascorbic acid	Folic acid	Pyridoxine	Tocoferol
319	1	Two important products of pentose phosphate pathway are:	NADPH and pentose sugars	Glucose and NADH	Pentose sugars and sedoheptulose	Pentose sugars and 4 membered sugars	NADH and pentose sugars
320	1	A cataract and fatty degeneration of the liver develop in the conditions of high galactose and low glucose level in blood. What disease do these symptoms testify to?	Galactosemia	Lactosemia	Fructosemia	Diabetes mellitus	Steroid diabetes
321	1	Transketolase (one of enzymes of pentose phosphate pathway) contains as coenzyme:	TPP	Tocoferol	Pyridoxine	NAD	Folic acid
322	1	A 2-year-old boy has the increase of liver and spleen sizes detected and eye cataract present. The total sugar level in blood is increased, but glucose tolerance is within the normal range. The inherited disturbance of the metabolism of what substance is the cause of the indicated state?	Galactose	Saccharose	Maltose	Fructose	Glucose
323	1	A patient has an increased pyruvate concentration in blood, most of it is excreted with the urine. What kind of avitaminosis has this patient?	B1	B3	B6	B2	E
324	1	Which of the following enzymes catalyze reaction: Fructose + ATP → Fructose-1-phosphate + ADP:	Fructokinase	Pyruvate kinase	Galactokinase	Hexokinase	Glucokinase

325	1	Dehydrogenase enzymes of the hexose-monophosphate shunt are	NADP+ specific	NAD+ specific	Biotin specific	FAD specific	FMN specific
326	1	In a patient are manifested symptoms of intoxication with arsenic compounds. What metabolic process is damaged taking into account that arsen containing substances inactivate lipoic acid?	Oxidative decarboxylation of pyruvate	Microsomal oxidation	Coupling of oxidation and phopsphorylation	Neutralization of superoxide anions	Fatty acids biosynthesis
327	1	Before pyruvic acid enters the TCA cycle it must be converted to:	Acetyl CoA	α-ketoglutarate	Lactate	Citrate	Glucose
328	1	Which from listed below vitamins is involved in the oxidative decarboxylation pyruvate?	Lipoic acid	Tocoferol	Ascorbic acid	Pyridoxine	Folic acid
329	1	The oxidative phase of pentose phosphate pathway is very active in cells such as red blood cells or hepatocytes. Which of the following products is the end product of this phase?	Ribulose-5-phoshate	6-Phospho-gluconate	Pyruvate	Glyceraldehyde-3-phosphate	Fructose-6-phoshate
330	1	Which from listed below pathways is responsible for the synthesis of ribose-5-phosphate, a component of nucleic acids:	Pentose phosphate pathway	Embden-Meyerhof-Parnas pathway	Oxidative decarboxylation of pyruvate	Glycolysis	Krebs cycle
331	1	Which of the following substances inhibit pentose phosphate pathway:	NADPH+	Mg2+	NAD+	FAD	ADP

332	1	NADPH serves to regenerate in red cells to prevent their lysis:	Glutathione	NADP	Cysteine	Carnitine	Cholesterol
333	1	There are several pathways for glucose transformation and utilization, one of them is pentose phosphate pathway, which actively proceeds in liver, adrewnal cortex, red blood cells. What is the main aim of this pathway?	NADPH2 generation and production of pentoses	Acetyl-CoA production	Synthesis of glycogen and fat	FADH2 generation	NADH2 and gluconioc acid production
334	1	Our body can get pentoses from:	HMP shunt	Glycolytic pathway	Uromic acid pathway	TCA cycle	Gluconeogenesis
335	1	Transketolase activity is affected in:	Thiamine deficiency	Pyridoxine deficiency	Ascorbic acid deficiency	Biotin deficiency	PABA deficiency
336	1	Which of the following symptoms would be seen in a patient with a severe deficiency of thiamine?	A decreased level of transketolase activity in red blood cells	A decrease in blood level of lactate	Xerophthalmia	A low level of cell transaminase activity	An increased clotting time of blood
337	1	Oxidative decarboxylation of pyruvate requires:	CoASH	Pyridoxal phosphate	Biotin	Cytochromes	NADP+
338	1	The glucoso-6-phosphate dehydrogenase deficiency causes hemolytic anemia due to lack of:	NADPH	NADP	Pentoses	ATP	Cholesterol

329	1	Which of the following metabolite integrates glucose and fatty acid metabolism?	Acetyl CoA	Glucose	Pyruvate	Citrate	Lactate
330	1	Characteristic sign of glycogenosis is muscle pain during physical work. Blood examination usually reveals hypoglycemia. This pathology is caused by congenital deficiency of the following enzyme:	Glycogen phosphorylase	γ-amylase	α-amylase	Glucose 6-phosphate dehydrogenase	Lysosomal glycosidase
331	1	Pancreas is known as a mixed gland. Endocrine functions include production of insulin by beta cells. This hormone affects metabolism of carbohydrates. What is its effect on the activity of glycogen phosphorylase (GP) and glycogen synthase (GS)?	It inhibits GP and activates GS	It activates both GP and GS	It inhibits both GP and GS	It activates GP and inhibits GS	It does not affect the activity of GP and GS
332	1	Prolonged fasting causes hypoglycemia which is amplified by alcohol consumption, as the following process is inhibited:	Gluconeogenesis	Proteolysis	Glycolysis	Glycogenolysis	Lipolysis
333	1	What types of linkages are present between the glucose units of glycogen?	α-1-4 and α-1-6 linkages	β-1-6 linkages only	α-1-4 linkages only	β-1-4 and β-1-6 linkages	β-1-4 linkages only
333	1	A child has a history of hepatomegaly, hypoglycemia, seizures, especially on an empty stomach and in stressful situations. The child is diagnosed with Gierke disease. This disease is caused by the genetic defect of the following enzyme:	Glucose-6-phosphatase	Phosphoglucomutase	Amyloid-1,6-glycosidase	Glycogenphosphorylase	Glucokinase

334	1	The greatest quantity of the body glycogen can be found in which of the following human tissue?	Liver	Kidney	Sceletal muscles	Cardiac muscle	Brain
335	1	The conversion of alanine to glucose is termed:	Gluconeogenesis	Oxidative decarboxylation	Glycolysis	Specific dynamic action	Glycogenesis
336	1	Glycogen polysaccharide is synthesized from the active form of glucose. The immediate donor of glucose residues during the glycogenesisis:	UDP-glucose	Glucose-1-phosphate	ADP-glucose	Glucose-6-phosphate	Glucose-3-phosphate
337	1	The increase in glucose concentration in blood under the action of glucagone is connected with activation of the next enzyme:	Glycogen phosphorylase	Glycogen synthase	Aldolase	Glucokinase	Hexokinase
338	1	The genetic defect of pyruvate carboxylase deficiency is the cause of delayed physical and mental development and early death in children. This defect is characterized by lacticemia, lactaciduria, disorder of a number of metabolic pathways. In particular, the following process is inhibited:	Citric acid cycle and gluconeogenesis	Pentose phosphate pathway and glycolysis	Lipolysis and lipogenesis	Glycogenesis and glycogenolysis	Glycolysis and glycogenolysis
339	1	Activity of enzymes of glycogen metabolism is regulated in the next way:	Covalent modification by phosphorylation-dephosphorylation	By dissotiation into subunits	By limited proteolysis	By isomerization of reaction products	By a noncompetitive inhibition
340	1	The blood sugar raising action of the hormones of suprarenal cortex is due to:	Gluconeogenesis	Glycolysis	Due to inhibition of glomerular filtration	Glucagon-like activity	Glycogenolysis

341	1	During starvation muscle proteins break up into free amino acids. These compounds will be the most probably involved into the following process:	Gluconeogenesis in liver	Synthesis of higher fatty acids	Gluconeogenesis in muscles	Glycogenolysis	Decarboxylation
342	1	Reactions of synthesis and degradation of glycogen in cells are regulated by phosphorylation of the next key enzymes of glycogen metabolism:	Glycogen synthase and glycogen phosphorylase	Adenilate cyclase and lipase	Phosphoprotein phosphatase and protein kinase	Glycogen synthase and protein kinase	Glycogen phosphorylase and lipase
343	1	During biochemical investigation of blood in a patient was detected hypoglycemia in fasting condition. Investigation of liver bioptates revealed the failure of glycogen synthesis. What enzyme deficiency may cause such status?	Glycogen synthase	Phosphorylase	Aldolase	Fructose bisphosphatase	Pyruvate carboxylase
344	1	A patient ill with neurodermatitis has been taking prednisolone for a long time. Examination revealed high rate of sugar in his blood. This complication is caused by the drug in fluence upon the following link of carbohydrate metabolism:	Gluconeogenesis activation	Glycogenogenesis activation	Intensification of glucose absorption in the bowels	Inhibition of glycogen synthesis	Activation of insulin decomposition
345	1	Phosphorolysis of carbohydrates plays a key role in a mobilization of polysaccharides. Under the action of phosphorylase from glycogen is produced the next substance:	Glucose -1-phosphate	Glucose	Fructose 6-phosphate	Glucose 6-phosphate	Glucose 1,6-bis-phosphate
346	1	Which one of the following is a rate limiting enzyme of gluconeogenesis?	Pyruvate carboxylase	Phosphoglucomutase	Pyruvate kinase	Phsophofructokinase	Hexokinase

347	1	Insulin exhibits the next effect on glycogen metabolism:	Stimulation of glycogenesis by activation of glycogen synthase	Stimulation of glycogen breakdown by activation of phosphorylase	Stimulation of glycogen utilization in muscle cells	Suppression of glycogen breakdown by inhibition of debranching enzyme	Inhibition of glycogenolysis by activation of phosphorylase a
348	1	Glycogen synthesis takes place under the action of several enzymes. Indicate, what enzyme provides the formation of 1,6-glycosidic bonds in glycogen molecule?	Glycosyl 4,6-transferase	Glycogen synthase	Hexokinase	Glucokinase	Glucose 1-phosphate uridil transferase
349	1	In an infant with point mutations in genes the absence of glucose-6-phosphatase, hypoglycemia and hepatomegalia were revealed. To what disease arecharacteristic these symptoms?	Gierke disease	Adison disease	Parkinson disease	Cori disease	Mac Ardle disease
350	1	In a weak apathic infant an enlarged liver was detected, which in investigation of biopcia pieces showed an excess of glycogen. Blood glucose concentration is under the normal value. What may be the cause of this disease?	Lowered activity of glycogen phosphorylase in a liver	Lowered activity of glycogen synthase	Lowered activity of glucose 6-phosphate isomerase	Lowered activity of glucokinase	Deficiency of gene responsible for synthesis of glucose 1-phosphate uridyl transferase
351	1	What biochemical process is stimulated in the liver and kidneys of a patient exhausted by starvation?	Gluconeogenesis	Synthesis of urea	Synthesis of bilirubin	Formation of hippuric acid	Synthesis of uric acid
352	1	Post-translational covalent modification is an important factor in the regulation of the enzymes' activity. Choose the mechanism of regulation of glycogen phosphorylase and glycogen synthetase activities from the following:	Phosphorylation-dephosphorylation	ADP-ribosylation	Methylation	Adenylation	Restricted proteolysis

353	1	In animals, an enzyme unique to gluconeogenesis is:	Fructose 1,6-bisphosphatase	Phosphglycero mutase	Glyceraldehydes 3-phosphate dehydrogenase	Aldolase	Enolase
354	1	The activation of liver phosphorylase is achieved by the next process:	Phosphorylation by ATP	Phosphorylation by cAMP	Glycosylation in Golgi vesicles	Dephosphorylation by proteinphosphatase	Limited proteolysis
355	1	The carbohydrate reserved in human body is:	Glycogen	Lactose	Inulin	Glucose	Starch
356	1	Inactivation of glycogen synthase is dependent from the next reaction:	Phosphorylation by ATP	Dephosphorylation by protein phosphatase	Incorporation of enzyme into lysosomal vesicles	Irreversible inhibition by glucose 6-phosphate	Allosteric inhibition by glucagone
357	1	The active form of glycogen ___ is phosphorylated; the active form of glycogen ___ is dephosphorylated.	Phosphorylase; synthase	Synthase; phosphorylase	Hydrolase; semisynthase	Dehydrogenase; hydrolase	Hydrolase; dehydrogenase
358	1	Which of the following is a precursor for glucose synthesis via gluconeogenesis?	Glycerol	Cortisone	Glucagon	Cholesterol	Leucin
359	1	Lactate formed in muscles can be utilised through:	Cori’s cycle	Rapoport-Luebeling cycle	Citric acid cycle	Glucose-alanine cycle	Tricarboxylic acid cycle
360	1	Some hours after an intensive physical training a sportsman showed activated gluconeogenesis. Which of the following is the basic substrate of gluconeogenesis?	Lactate	Serine	Aspartate	Glutamate	α - Ketoglutarate

361	1	The characteristic enzymes of gluconeogensis are found in the cytosol, except for:	Pyruvate carboxlyase, which is in the mitrochondria	Glucose-6-phosphatase, which is in the mitrochondria	Fructose-1,6-bisphosphatase, which is in the mitochondria	Fructose-1,6-bisphosphatase, which is in the glycogen granule	Pyruvate carboxylase, which is in the glycogen granule
362	1	Which of the following supports gluconeogenesis?	Pyruvate + ATP + HCO3 = oxaloacetate + ADP + Pi + H+	Lysine degradation	Leucine degradation	Acetyl CoA + oxaloacetate + H2O = citrate + CoA	α-ketoglutarate + aspartate = glutamate + oxaloacetate
363	1	The branching enzyme acts on the glycogen when the glycogen chain has been lengthened to between glucose units:	1 and 6	2 and 7	3 and 9	6 and 11	5 and 10
364	1	Glycogen synthetase activity is depressed by:	Cyclic AMP	Insulin	Glucose	Fructokinase	Lactate
365	1	Cori’s cycle transfers	Lactate from muscles to liver	Glucose from muscles to liver	Lactate from liver to muscles	Pyruvate from liver to muscles	Glucose from kidneys to muscles
366	1	An essential for converting Glucose to Glycogen in Liver is:	UTP	CTP	GTP	cAMP	Lactic acid
367	1	Patient having McArdle's disease suffers from painful muscle cramping after brief exercise. The condition results from a deficiency in of of the following enzymes in glycogen breakdown:	Muscle glycogen phosphorylase	Liver amylo-1,6-glucosidase activity of the debranching	Muscle 4-α -glucanotransferase actvity of the debranching enzyme	Liver glycogen phosphorylase	Muscle amylo-1,6-glucosidase activity of the debranching

368	1	Phosphorylase a is coplex enzyme, which needs for activity the next coenzyme:	Pyridoxal phosphate	NAD	FAD	TPP	Coenzyme A
369	1	Amylo-1,6-glucosidase is called:	Debranching enzyme	Branching enzyme	Glucantransferase	Phosphorylase	Sythase
370	1	Protein avidin, a minor constituent of uncooked eggs, is a powerful spec inhibitor of biotin enzymes. Which of the below listed metabolic transformations would be blocked in case of the avidin addition to the cells homogenates?	Pyruvate→Oxaloa cetate	Oxaloacetate→ glucose	Glucose→pyruvate	Glucose→ribosc 5-phosphate	Lactate→pyru vate
371	1	Each of the following enzymes is required for the conversion of glycerol to glucose EXCEPT:	Phosphoenol pyruvate carboxykinase	Glycerol-3-phosphate dehydrogenase	Glucose-6-phosphatase	Fructose 1.6 bisphosphtase	Triosophospha te isomerase
372	1	A 46-year-old woman complains of dryness in the oral cavity, thirst, frequent urination, general weakness. Biochemical research of the patient's blood showed hyperglycemia and hyperketonemia. Sugar and ketone bodies are revealed in the urine. Diffuse changes in myocardium are marked on the electrocardiogram. Make an assumptive diagnosis of the illness.	Diabetes mellitus	Alimentary hyperglycemia	Acute pancreatitis	Diabetes insipidus	Ischemic cardiomyopath y
373	1	A patient with diabetes mellitus suffers from persistently nonhealing surgical wound, which is a sign of disrupted tissue trophism. What is the cause of such disorder?	Disruption of protein metabolism regulation	Anemia	Increased lipid catabolism	Ketonemia	Hypoglycemia

374	1	A patient with insulin-dependent diabetes mellitus has been administered insulin. After a certain period of time the patient developed fatigue, irritability, excessive sweating. What is the main mechanism of such presentations developing?	Carbohydrate starvation of the brain	Increased ketogenesis	Increased glycogenolysis	Increased lipogenesis	Decreased glyconeogenesis
375	1	A patient was admitted to a hospital in comatous state. The accompanying mates explained that the patient loss his consciousness during the training on the last stage of marathon distance. What coma type can be recognized?	Hypoglycemic	Hyperglycemic	Hypovolemic	Hypothyroid	Hepatic
376	1	Prior to glucose utilization in cells it is transported inside cells from extracellular space through plasmatic membrane. This process is stimulated by the following hormone:	Insulin	Glucagon	Aldosterone	Thyroxin	Adrenalin
377	1	The concentration of glucose in the blood plasma of a healthy man varies within the following limits:	3.3-5.5 mM/l	1.0-2.0 mM/1	6.0-9.5 mM/1	10.0-25.0 mM/1	2.0-4.0 mM/1
378	1	A 30-year-old man with diabetes mellitus type I was hospitalised. The patient is comatose. Laboratory tests revealed hyperglycemia and ketonemia. What metabolic disorder can be detected in this patient?	Metabolic acidosis	Metabolic alkalosis	Respiratory acidosis	Respiratory alkalosis	Normal acid-base balance
379	1	Increase in blood glucose concentration under the action of glucagone is caused by activation of the following enzyme:	Glycogen phosphorylase	Glycogen synthase	Aldolase	Glucokinase	Hexokinase

380	1	The normal glucose tolerance curve reaches peak is:	30 min	1 ½ hr	2 hrs	2 ½ hr	3 hrs
381	1	A 15-year-old patient has fasting plasma glucose level 4,8 mmol/l, one hour after glucose challenge it becomes 9,0 mmol/l, in 2 hours it is 7,0 mmol/l, in 3 hours it is 4,8 mmol/l. Such parameters are characteristic of:	Subclinical diabetes mellitus	Cushing's disease	Healthy person	Diabetes mellitus type 2	Diabetes mellitus type 1
382	1	The patient with complaints of permanent thirst applied to the doctor. Hyperglycemia, polyuria and increased concentration of 17-ketosteroids in the urine were revealed. What disease is the most likely?	Steroid diabetes	Insulin-dependent diabetes mellitus	Myxoedema	Type I glycogenosis	Addison's disease
383	1	In a 57 years old patient suffering from diabetes mellitus ketoacidosis has been developed. Biochemical background of this status is decrease in utilization of acetyl-CoA due to a deficiency of:	Oxaloacetate	Glutamate	α-ketoglutarate	Aspartate	Succinate
384	1	A nurse accidentally injected a nearly double dose of insulin to a patient with diabetes mellitus. The patient lapsed into a hypoglycemic coma. What drug should be injected in order to help him out of coma?	Glucose	Insulin	Lidase	Somatotropin	Noradrenaline
385	1	Glucose is completely reabsorbed in renal tubules up to the next value of blood glucose level:	180 mg/dl	60 mg/dl	250 mg/dl	80 mg/dl	150 mg/dl

386	1	A patient is ill with diabetes mellitus accompanied by hyperglycemia on an empty stomach (7,2 millimole/l). The hyperglycemia rate can be retrospectively estimated (over the last 4-8 weeks before the examination) on the ground of the rate of the following blood plasma protein:	Glycated hemoglobin	Ceruloplasmin	C-reactive protein	Fibrinogen	Albumin
387	1	In patient S. blood glucose level is over the renal threshold, polyuria is observed, as well as acidosis and ketonuria. What disease can be suggested?	Diabetes mellitus	Hypercorticism	Starvation	Hyperthyreosis	Addison disease
388	1	A 58 years old woman, in a heavy state, cloudy conciousness, dry skin, cyanosis, an odor of spoiled apples from mouth. Blood glucose level 15,1 mmol/l, in urine – 3,5 %. This state is caused by:	Hyperglycemic coma	Hypoglycemic coma	Uremic coma	Anaphylactic shock	Hypovolemic coma
389	1	Destruction of pancreatic islets of Langerhans results in the decrease of production of:	Glucagon and insulin	Parathhormone and cortisone	Thyroxyne and calcitonin	Insulin and adrenaline	Callicrein and angiotensin
390	1	A 38-year-old man is receiving treatment for schizophrenia in hospital. Fhe initial levels of glucose, ketone bodies and urea in the blood are within the normal range. Shock therapy put into practice by regular insulin injections resulted in the development of the comatose state which improved the clinical status of the patient. What is the most probable cause of insulin coma?	Hypoglycemia	Ketonemia	Metabolic acidosis	Dehydratation of tissues	Hyperglycemia

391	1	Insulin is a hormone with _____ concerning carbohydrates metabolism:	Anabolic activity	Catabolic activity	Lypolytic activity	Glycogenolytic activity	Luteotropic activity
392	1	Before the cells can utilize the glucoze, it is first transported from the extracellular space through the plasmatic membrane inside theml. This process is stimulated by the following hormone:	Insulin	Glucagon	Thyroxin	Aldosterone	Adrenalin
393	1	Blood glucose level is decreased by:	insulin	glucagone	epinephrine	glucocorticoid hormones	testosterone
394	1	Renal threshold, polyuria is observed, as well as acidosis and ketonuria. What disease can be suggested?	Diabetes mellitus	Starvation	Hypercorticism	Addison disease	Hyperthyreosis
395	1	A patient suffering from diabetes mellitus fainted after the introduction of insulin, and then cramps appeared. What level of sugar was determined in the patient's blood by means of biochemical analysis?	1.5 mM/1	5.5 mM/1	8.0 mM/1	3.3 mM/1	10.0 mM/1
396	1	A comatose patient was taken to the hospital. He has a history of diabetes mellitus. Objectively: Kussmaul breathing, low blood pressure, acetone odor of breath. After the emergency treatment the patient’s condition improved. What drug had been administered to the patient?	Insulin	Furosemide	Glibenclamide	Isadrinum	Adrenaline
397	1	Patients who suffer from severe diabetes and don’t receive insulin have metabolic acidosis. This is caused by increased concentration of the following metabolites:	Ketone bodies	Fatty acids	Unsaturated fatty acids	Triacylglycerols	Cholesterol

398	1	Glucagon is produced in the next endocrine gland:	Langerhans islands, α cells	Thymus	Medullar part of adrenals	Parathyroid gland	Pitiutary gland
399	1	A 40-year-old woman diagnosed with diabetes mellitus is admitted to a department of endocrinology. The patient complains of thirst and increased hunger. What pathological components are exposed at laboratory research of the patient's urine?	Glucose, ketone bodies	Protein, amino acid	Protein, creatine	Bilirubin, urobilin	Blood
400	1	A 45-year-old woman does not have any symptoms of insulin dependent diabetes mellitus but testing on an empty stomach showed the increase of the blood glucose level (7.5 mM/l). What additional laboratory test needs to be done to substantiate the diagnosis?	Determination of tolerance to glucose	Determination of tolerance to glucose on an empty stomach	Determination of rest nitrogen level in the blood	Determination of ketone bodies concentration in the urine	Determination of glycosylated hemoglobin level
401	1	Appearance of sugar and ketone bodies is revealed in the patient's urine. Blood glucose concentration is 10.1 mM/l. What is a presumptive diagnosis of the patient?	Diabetes mellilus	Myocardial infarction	Toxic hepatitis	Pancreatitis	Atherosclerosis
402	1	Cyclic AMP is formed from ATP by the enzyme adenylate cyclase which is activated by the hormone:	Epinephrine	Testosterone	Progesterone	Cortisol	Insulin

403	1	A 27-year-old man has been rushed to the emergency room following his sudden collapse and entry into a state of unconsciousness. Examination of personal belongings revealed the patient is an insulin-dependent diabetic. A rapid decline in which of the following humoral factors likely triggered the sudden collapse of the patient?	Glucose	Insulin	Glucagon	Fatty acids	Triglyceride
404	1	Glucose is completely reabsorbed in renal tubules up to the next value of blood glucose level:	10 mmoles/l	7,5 mmoles/l	5,5 mmoles/l	80 mmoles/l	150 mmoles/l
405	1	Patient 47 years old is suffering from lung cancer. In the lung's tumor tissue glucose uptake proceed about 10 times faster than in normal, noncancerous tissues. Which of the following pathways is activated in such tissues under hypoxic conditions in tumor:	Glycolysis	Gluconeogenesis	Pentose phosphate pathway	Lipogenesis	Glycogenesis
406	1	In a patient suffering from a congenital defect in the liver enzyme fructose-1,6-bisphosphatase, abnormally high levels of lactate in the blood plasma was detected. Which pathway inhibition takes place in this patient?	Gluconeogenesis	Glycolysis	Pentose phosphate pathway	Lipogenesis	Glycogenesis

407	1	A 39 old male patient was diagnosed with a Wernicke-Korsakoff syndrome, caused by a severe deficiency of thiamine pyrophosphate (TPP) mostly resulting by chronic, heavy alcohol consumption which interferes with the intestinal absorption of thiamin. Which enzyme of pentose phosphate pathway needs TPP as a coenzyme?	Transketolase	Transaldolase	Lactonase	Glucose 6-phosphate dehydrogenase	Phosphopentose isomerase
408	1	A 19-year-old girl was brought to the emergency department by her parents who reported that she had been vomiting and feeling weak for 24 h. The patient complained of feeling lethargic and fatigued for a few weeks. Despite drinking large volumes of water, she continued to feel thirsty all the time. She also complained of an increased frequency of urination during the day and at night. Plasma glucose concentration was 11.1 mmol/L (200 mg/dL). What is the most probable diagnosis?	Diabetes mellitus.	Alimentary hyperglycemia.	Acute pancreatitis.	Ischemic cardiomyopathy.	Diabetes insipidus
409	1	A man with insulin-dependent diabetes is brought to the emergency room in a near-comatose state. While vacationing in an isolated place, he lost his insulin medication and has not taken any insulin for two days. Which changes in his blood analysis did it cause?	Hyperglycemia	Hypoglycemia	Hyperproteinimia	Hypoproteinimia	Hyperuricemia

410	1	A 2-day-old baby boy was noted to be jaundiced (yellowing of skin and eyes). His initial bilirubin was 25 mg/dL (normal range is 2–10 mg/dL). By day 5 of age, bilirubin levels began falling and continued to fall over the subsequent few days. There was an associated fall in hemoglobin to a minimum and the reticulocyte count was raised at 20%. A glucoso-6-phosphate dehydrogenase assay was performed and confirmed erythrocytic glucoso-6-phosphate dehydrogenase deficiency. Which of the following pathways is stopped in such disease?	Pentose phosphate pathway	Glycolysis	Gluconeogenesis	Lipogenesis	Glycogenesis
411	1	A 3-year-old girl with mental retardation has been diagnosed with sphingomyelin lipidosis (Niemann-Pick disease). In this condition synthesis of the following substance is disrupted:	Sphingomyelinase	Glycosyltransferase	Sphingosine	Ceramides	Gangliosides
412	1	Obesity is a common disease. The aim of its treatment is to lower content of neutral fats in the body. What hormonsensitive enzyme is the most important for intracellular lipolysis?	Triacylglycerol lipase	Protein kinase	Adenylate kinase	Diacylglycerol lipase	Monoacylglycerol lipase
413	1	Gangliosides have the following physiological significance:	Provide hydrophilic and negative charge to the cell surface	Are used as energetic material	Activate transcription processes in cell nucleus	Catalyze the cleavage of proteins in cell cytoplasm	Are involved in activation of amino acids
414	1	Disruption of nerve fiber myelinogenesis causes neurological disorders and mental retardation. These symptoms are typical for hereditary and acquired alterations in the metabolism of:	Sphingolipids	Neutral fats	Higher fatty acids	Cholesterol	Phosphatidic acid

415	1	A patient has normally coloured stool including a large amount of free fatty acids. The reason for this is a disturbance of the following process:	Fat absorption	Fat hydrolysis	Biliary excretion	Choleresis	Lipase secretion
416	1	Due to the blockage of the common bile duct (which was radiographically confirmed), the biliary flow to the duodenum was stopped. We should expect the impairment of:	Fat emulsification	Protein absorption	Carbohydrate hydrolysis	Secretion of hydrochloric acid	Salivation inhibition
417	1	A coprological survey revealed lightcolored feces containing drops of neutral fat. The most likely reason for this condition is the disorder of:	Bile inflow into the bowel	Gastric juice acidity	Pancreatic juice secretion	Intestinal juice secretion	Intestinal absorption
418	1	A patient complains of frequent diarrheas, especially after consumption of rich food, weight loss. Laboratory examination revealed steatorrhea; his feces were hypocholic. What might have caused such condition?	Obturation of biliary tracts	Inflammation of mucous membrane of small intestine	Lack of pancreatic lipase	Lack of pancreatic phospholipase	Unbalanced diet
419	1	Examination of a patient suffering from chronic hepatitis revealed a significant decrease in the synthesis and secretion of bile acids. What process will be mainly disturbed in the patient's bowels?	Fat emulsification	Protein digestion	Carbohydrate digestion	Glycerin absorption	Amino acid absorption
420	1	A 6 year old child was delivered to a hospital. Examination revealed that the child couldn't fix his eyes, didn't keep his eyes on toys, eye ground had the cherry-red spot sign. Laboratory analysis showed that brain, liver and spleen had high rate of ganglioside glycometide. What congenital disease is the child ill with?	Tay-Sachs disease	Wilson's syndrome	Turner's syndrome	Niemann-Pick disease	MacArdle disease

421	1	After intake of rich food a patient feels nausea and sluggishness; with time there appeared signs of steatorrhea. Blood cholesterine concentration is 9,2 micromole/l. This condition was caused by lack of:	Bile acids	Triglycerides	Fatty acids	Phospholipids	Chylomicrons
422	1	Examination of a man who hadn't been consuming fats but had been getting enough carbohydrates and proteins for a long time revealed dermatitis, poor wound healing, vision impairment. What is the probable cause of metabolic disorder?	Lack of linoleic acid, vitamins A, D, E, K	Lack of palmitic acid	Lack of vitamins PP, H	Low caloric value of diet	Lack of oleic acid
423	1	Examination of cell culture not from a patient with lysosomal pathology revealed accumulation of great quantity of lipids in the lysosomes. What of the following diseases is this disturbance typical for?	Tay-Sachs disease	Gout	Phenylketonuria	Wilson disease	Galactosemia
424	1	Phosphoglycerides are complex lipids, represented by:	Phosphatidylcholine	Sphingomyelin	Galactocerebroside	Thromboxane A	Ganglioside GM-2
425	1	Sphingomyelin contains residues of the following substance:	Sphingosine	Glycerol	Galactose	Inositol	Sulfuric acid
426	1	Cholesterol is a starting material for biosynthesis of:	Bile acids	N-acetyl-galactosamine	Lecithin	Prostaglandins	Sphingomyelin
427	1	Fatty acids differ from one another due to differences in:	All of the above	The number of carbon atoms	The degree of saturation	The number of double bond	-

428	1	Arachidonic acid as essential nutrient is needed for normal growth and development of animal and man. It is a precursor of biologically active substances. Indicate what compound is synthesized from arachidonic acid:	Prostaglandine E1	Ethanolamine	Triiodothyronine	Choline	Noradrenaline
429	1	Chose from listed below a hormone, which stimulates the formation of glycogen and triacylglycerols:	Insulin	Norepinephrine	Glucagon	Epinephrine	Thyroxine
430	1	In digestion of dietary lipids there is a need of one of the digestive secretions. What secretion listed below takes part in lipids emulsification?	Bile	Intestinal juice	Pancreatic juice	Saliva	Gastric juice
431	1	Phospholipids are important cell membrane components because:	They have both polar and non polar portions	They have glycerol	They can form bilayers in water	They combine covalently with proteins	They consist of fatty acids
432	1	Lipids have the following properties:	All of these	Insoluble in water and soluble in fat solvent	High energy content	Structural component of cell membrane	Precursors in biosynthesis of prostaglandins
433	1	Indicate which from listed below disorders of lipid metabolism occur in fat tissue:	Obesity	Steatorrhea	Ketosis	Retention hyperlipemia	Fatty infiltration of liver
434	1	Hepatic liponenesis is stimulated by:	Insulin	cAMP	Glucagon	Epinephrine	Cortisol
435	1	Lipids are stored in the body mainly in the form of:	Triglycerides	Glycolipids	Phospholipids	Fatty acids	Steroids
436	1	Pancreatic lipase requires for its activity:	Co-lipase	Bile salts	Phospholipids	Amino acids	All of these

437	1	Bile acids are necessary for fat digestion. They are produced in the liver from the next precursor:	Cholesterol	Protoporphyrine IX	Corticosterol	Lecithin	Arachidonic acid
438	1	Free fatty acids are transported in the blood:	Combined with albumin	Combined with fatty acid binding protein	Combined with β - lipoprotein	In unbound free salts	Combined with globulin
439	1	Lipid stores are mainly present in:	Adipose tissue	Liver	Brain	Muscles	Kidneys
440	1	Co-lipase is a:	Protein	Vitamin	Bile salt	Phospholipid	Amino acid
441	1	The form in which most dietary lipids are packaged and exported from the intestinal mucosa cells is as follows:	Chylomicrons	Mixed micelles	Free triacylglycerol	2-monoacylglycerol	Free fatty acid
442	1	Chylomicron remnants are catabolised in:	Liver	Adipose tissue	Intestine	Liver and intestine	Kidneys
443	1	Adipose tissue responds to low insulin/glucagon ratio by:	Stimulating hormone-sensitive lipase	Dephosphorylating the interconvertible enzymes	Stimulating the deposition of fat	Increasing the amount of pyruvate kinase	Stimulating phenylalanine hydroxylase
454	1	The high glucagon/insulin ratio seen in starvation:	All of the above	Stimulates β-oxidation by inhibiting the production of malonyl CoA	Leads to increased concentrations of ketone bodies in the blood	Promotes mobilization of fatty acids from adipose stores	None of the above
455	1	Bile acids are derivatives of:	Cholesterol	Heme	Sphingomyeline	Phosphatidyl choline	Long chain fatty acid
456	1	In patients suffering from diabetes mellitus an increase in a content of non esterified fatty acids (NEFA) in blood is observed. It may be caused by	Increase in activity of triacylglycerol lipase	Stimulation of ketone bodies utilization	Activation of synthesis of apolipoproteins A1 , A2, A3	Decrease in activity of phosphatidylcholine-cholesterol-acyltransferase in blood plasma	Accumulation in cytosol of palmitoyl-CoA

457	1	The essence of lipolysis, that is the mobilization of fatty acids from neutral fats depots, is an enzymatic process of hydrolysis of triacylglycerols to fatty acids and glycerol. Fatty acids that release during this process enter blood circulation and are transported as the components of:	Serum albumins	Globulins	HDL	LDL	Chylomicrons
458	1	Which one of the following statements about the absorption of lipids from the intestine is correct?	Dietary triacylglycerol is partially hydrolyzed and absorbed as free fatty acids and monoacyl glycerol	Release of fatty acids from triacylglycerol in the intestine is inhibited by bile salts	Dietary triacylglycerol must be completely hydrotyzed to tree fatty acids and glycerol before absorption	Fatty acids that contain ten carbons or less are absorbed and enter the circulation primarily via the lymphatic system	Formation of chylomicrons does not require protein synthesis in the intestinal mucosa
459	1	After consumption of lipids in the body than begins their digestion and absorption in intestines. What products of lipid hydrolysis are absorbed in the intestine?	Monoacylglycerol , fatty acids	Amino acids	Polypeptides	Monosacharides	Lipoproteins
460	1	After the consumption of animal food rich in fats, a patient feels discomfort, and droplets of fats are found during laboratory investigation of his feces. Bile acids are revealed in the urine. The cause of such state is the deficiency of ___ in the digestive tract.	Bile acids	Fatty acids	Chylomicrons	Triacylglycerols	Phospholipids
461	1	Fabry’s disease (one of sphingolipidoses) is an autosomal recessive disease. Major symptoms of this disease: skin rash, kidney failure, pain in lower extremities. It is caused by a deficiency of:	α-Galactosidase A	Hexosaminidase A and B	Gm1 Gangliosidase	Galactocerebrosidase	Ceraminase

462	1	35-year-old man with pheochromocytoma has high levels of epinephrine and norepinephrine registered in the blood. The concentration of free fatty acids is increased by a factor of eleven. Which of the following enzymes accelerates the lipolysis under the action of epinephrine?	Triacylglycerol lipase	Lipoprotein lipase	Phospholipase A	Phospholipase C	Cholesterol esterase
463	1	The insufficient secretion of what enzyme is the cause of incomplete fats degradation in the digestive tract and appearance of great quantity of neutral fats in feces?	Pancreatic lipase	Phospholipase	Entcrokinase	Amylase	Pepsin
464	1	All of the following statements describe phosphoglycerides EXCEPT:	They are a major store of metabolic energy	They are both amphipathic and amphoteric	They arise from glycerol-3-phosphate	They are found in cell membranes	They contain two fatty acid moieties
465	1	Which one of the following enzymes is NOT involved in the degradation of dietary lipids during digestion?	Lipoprotein lipase	Pancreatic lipase	Gastric lipase	Phospholipase A2	Cholesterol ester hydrolase
466	1	Essential fatty acids can`t be synthesized because mammals do not possess the enzymes for their biosynthesis. Which of the following is an essential fatty acid:	Linoleic acid	Palmitic acid	Oleic acid	Steraric	Butyric
467	1	Fatty acids differ from each other due to differences in:	All of the above	The number of carbon atoms	The degree of saturation	The number of double bond	-
468	1	Arachidonic acid as essential nutrient is needed for normal growth and development of animal and man. It is a precursor of biologically active substances. Indicate what compound is synthesized from arachidonic acid:	Prostaglandine E1	Ethanolamine	Triiodothyronine	Choline	Noradrenaline

469	1	Chose the lipid related compound which is primarily used as a source of metabolic energy:	Ketone bodies	Phosphoglycerides	Steroids	Sphingomyelin	Triglycerides
470	1	Lipids are the most valuable energetic material for an organism. What is the main pathway of fatty acids metabolism in cell mitochondria?	β–oxidation	Decarboxylation	Reduction	α-oxidation	γ-oxidation
471	1	Free fatty acids are transported in the blood:	Combined with albumin	Combined with fatty acid binding protein	Combined with β-lipoprotein	In unbound free salts	Combined with globulin
472	1	The intermediates in fatty acid synthesis are linked to acyl carrier protein (ACP), a component of fatty acid synthase. The prosthetic group of ACP is:	Phosphopantetheine	Methionine	Thiamine	Biotin	Cobalamin
473	1	Free glycerol cannot be used for triglyceride synthesis in:	Adipose tissue	Liver	Kidney	Intestine	-
474	1	In adipose tissue, glycerol-3-phosphate required for the synthesis of triglycerides comes mainly from:	Dihydroxyacetone phosphate formed in glycolysis	Hydrolysis of pre-existing triglycerides	Hydrolysis of phospholipids	Free glycerol	Cholesterol
475	1	The rate-limiting step of fatty acid synthesis is catalyzed by:	Acetyl-CoA carboxylase	ATP-citrate lyase	Acyl-CoA synthetase	Malic enzyme	Malonyl transacylase
476	1	Long chain fatty acids are first activated to acyl-CoA in:	Cytosol	Microsomes	Nucleus	Mitochondria	Ribosome

477	1	β-Oxidation of fatty acids:	Occurs by a repeated sequence of four reactions	Generates ATP in reactions of substrate level phosphorylation	Is controlled primarily by allosteric effectors	Uses only even-chain, saturated fatty acids as substrates	Uses NADP
478	1	One functional sub-unit of multi-enzyme complex for de novo synthesis of fatty acids contains:	Two —SH groups	One —SH group	Three —SH groups	Four —SH groups	Five —SH groups
479	1	The enzyme acyl-CoA synthase catalyses the conversion of a fatty acid to an active fatty acid in the presence of:	ATP	ADP	AMP	GTP	UDP
480	1	De novo synthesis of fatty acids occurs in:	Cytosol	Mitochondria	Microsomes	All of these	None of these
481	1	Acyl Carrier Protein contains the vitamin:	Pantothenic acid	Lipoic acid	Biotin	Folic acid	Ascorbic acid
482	1	Which of the following is required as a reducing agent in fatty acid synthesis?	NADPH	NADH	FADH2	FMNH2	FAD
483	1	An enzyme required for the synthesis of ketone bodies as well as cholesterol is:	HMG CoA synthetase	Acetyl CoA carboxylase	HMG CoA reductase	HMG CoA lyase	HMG CoA dehydrogenase
484	1	Ketone bodies are synthesized in:	Liver	Adipose tissue	Muscles	Brain	Kidney

485	1	Carnitine is required for the transport of:	Long chain fatty acids into mitochondria	Triglycerides into mitochondria	Short chain fatty acids into mitochondria	Triglycerides out of liver	Glycerol into cytosol
486	1	What process of lipid metabolism requires a protein with covalently bound prosthetic group derived from pantothenic acid?	Fatty acid biosynthesis	β-Oxidation of fatty acids	Utilization of ketone bodies	Bile acid synthesis from cholesterol	Utilization of LDL
487	1	The removal of two- carbon units from a fatty acyl coenzyme A (fatty acyl CoA) involves four sequential reactions. Which of the following best describes the reaction sequence?	Dehydrogenation, hydratation, dehydrogenation, cleavage	Oxidation, dehydration, oxidation, cleavage	Reduction, dehydration, reduction, cleavage	Hydrogenation, dehydration, hydrogenation, cleavage	Reduction, hydration, dehydrogenation, cleavage
488	1	The enzymes of β-oxidation are found in:	Mitochondria	Cytosol	Golgi apparatus	Nucleus	Microsomes
489	1	During each cycle of β-oxidation:	Two carbon atoms are removed from the carboxyl end of the fatty acid	One carbon atom is removed from the methyl end of the fatty acid	One carbon atom is removed from the carboxyl end of the fatty acid	Two carbon atoms are removed from the methyl end of the fatty acid	Three carbon atom is removed from the methyl end of the fatty acid
490	1	De novo synthesis and oxidation of fatty acids differ in the following respect:	Synthesis occurs in cytosol and oxidation in mitochondria	Synthesis is decreased and oxidation increased by insulin	NADH is required in synthesis and FAD in oxidation	Malonyl CoA is formed during oxidation but not during synthesis	-
491	1	Carboxylation of acetyl-CoA to malonyl-CoA takes place in the presence of:	Biotin	FAD	NAD+	NADP+	GTP

492	1	Which of the following can be used as a source of energy in extrahepatic tissues?	Acetoacetate	Acetone	Both acetoacetate and acetone	None of these	-
493	1	During the prolonged starvation in blood of a person an increase in ketone bodies content occurs. It is caused by the next factors:	Production of acetyl-CoA	Decrease of free fatty acid level in blood plasma	Mobilization of high density lipoproteins	Enhancment of fatty acids biosynthesis in liver	Decrease of triacylglycerols in adipose tissue
494	1	What process cannot occur in the absence of carnitine?	β-Oxidation of fatty acids	Cleavage of triacylglycerol	Utilization of ketone bodies	Fatty acid biosynthesis	Biosynthesis of prostaglandin
495	1	The essence of lipolysis, that is the mobilization of fatty acids from neutral fats depots, is an enzymatic process of hydrolysis of triacylglycerols to fatty acids and glycerol. Fatty acids that release during this process enter blood circulation and are transported as the components of:	Serum albumins	Globulins	HDL	LDL	Chylomicrons
496	1	In a patient suffering from diabetes mellitus acetone was detected in blood. Note the process of its production in the body.	By condensation of two molecules of acetyl-CoA	In course of α-oxidation of fatty acids	In course of β-oxidation of fatty acids	In course of γ-oxidation of fatty acids	In tricarboxylic acid cycle
497	1	Carnitine is recommended to a sportsman as a preparation that increases physical activity and improves achievements. What biochemical process is mostly activated under the action of carnitine?	Transport of fatty acids into mitochondria	Ketone bodies synthesis	Lipids synthesis	Tissue respiration	Steroid hormones synthesis
498	1	In diabetes mellitus and starvation there is an increase of ketone bodies content in blood, which are utilized as energetic material by tissues. Note the substance which is used in ketone bodies synthesis.	Acetyl-CoA	Citrate	Succinyl-CoA	α–Ketoglutarate	Malate

499	1	A 1 year old child was brought to a clinic with signs of muscle weakness. Through the inspection, the deficiency of carnitine in the muscles was determined. The biochemical mechanism of the development of this pathology consists in the disorder of the process of:	Transport of fatty acids into mitochondria	Regulation of the level of Ca2+ in mitochondria	Substrate level of phosphorylation	Utilization of lactate	Synthesis of actin and myosin
500	1	A patient with high rate of obesity was advised to use carnitine as a food additive in order to enhance "fat burning". What is the role of carnitine in the process of fat oxidation?	Transport of FFA (free fatty acids) from cytosol to the mitochondria	Transport of FFA from fat depots to the tissues	It takes part in one of reactions of FFA β-oxidation	FFA activation	Activation of intracellular lipolysis
501	1	Patients who suffer from severe diabetes and don't receive insulin have metabolic acidosis. This is caused by increased concentration of the following metabolites:	Ketone bodies	Fatty acids	Unsaturated fatty acids	Triacylglycerols	Cholesterol
502	1	The key reaction of fatty acid synthesis is production of malonyl-CoA. What metabolite is the source of malonyl-CoA synthesis?	Acetyl-CoA	Succinyl-CoA	Acyl-CoA	Malonate	Citrate
503	1	A 39-year-old female patient with a history of diabetes was hospitalized in a precomatose state for diabetic ketoacidosis. This condition had been caused by an increase in the following metabolite level:	Acetoacetate	Citrate	Alpha-ketoglutarate	Malonate	Aspartate
504	1	A sportsman needs to improve his sporting results. He was recommended to take a preparation that contains carnitine. What process is activated the most by this compound?	Fatty acids transporting	Amino acids transporting	Calcium ions transporting	Glucose transporting	Vitamin K transporting

505	1	An experimental animal has been given excessive amount of carbon-labeled glucose for a week. What compound can the label be found in?	Palmitic acid	Methionine	Vitamin A	Choline	Arachidonic acid
506	1	A dry-cleaner's worker has been found to have hepatic steatosis. This pathology can be caused by disruption of synthesis of the following substance:	Phosphatidylcholine	Tristearin	Urea	Phosphatidic acid	Cholic acid
507	1	Cholesterol content in blood serum of a 12-year-old boy is 25 mmol/l. Anamnesis states hereditary familial hypercholesterolemia caused by synthesis disruption of receptor-related proteins for:	Low-density lipoproteins	High-density lipoproteins	Chylomicrons	Very low-density lipoproteins	Middle-density lipoproteins
508	1	Increased HDL levels decrease the risk of atherosclerosis. What is the mechanism of HDL anti-atherogenic action?	They remove cholesterol from tissues	They supply tissues with cholesterol	They are involved in the breakdown of cholesterol	They activate the conversion of cholesterol to bile acids	They promote absorption of cholesterol in the intestine
509	1	Those organisms which in the process of evolution failed to develop protection from H_2O_2 can exist only in anaerobic conditions. Which of the following enzymes can break hydrogen peroxide down?	Peroxidase and catalase	Oxygenase and hydroxylase	Cytochrome oxidase, cytochrome B5	Oxygenase and catalase	Flavin-dependent oxidase
510	1	A 67-year-old male patient consumes eggs, pork fat, butter, milk and meat. Blood test results: cholesterol - 12,3 mmol/l, total lipids - 8,2 g/l, increased low-density lipoprotein fraction (LDL). What type of hyperlipoproteinemia is observed in the patient?	Hyperlipoproteinemia type IIa	Hyperlipoproteinemia type I	Hyperlipoproteinemia type IIb	Hyperlipoproteinemia type IV	Cholesterol, hyperlipoproteinemia

511	1	Steatosis is caused by the accumulation of triacylglycerols in hepatocytes. One of the mechanism of this disease development is a decrease in the utilization of LDL, neutral fat. What lipotropics prevent the development of steatosis?	Methionine, B6, B12	Arginine, B2, B3	Alanine, B1, PP	Valine, B3, B2	Isoleucine, B1, B2
512	1	A patient underwent a course of treatment for atherosclerosis. Laboratory tests revealed an increase in the antiatherogenic lipoprotein fraction in the blood plasma. The treatment efficacy is confirmed by the increase in:	HDL	VLDL	IDL	LDL	Chylomicrons
513	1	An experimantal animal that was kept on protein-free diet developed fatty liver infiltration, in particular as a result of deficiency of methylating agents. This is caused by disturbed generation of the following metabolite:	Choline	DOPA	Cholesterol	Acetoacetate	Linoleic acid
514	1	A 58-year-old patient suffers form the cerebral atherosclerosis. Examination revealed hyperlipoidemia. What class of lipoproteins will most probably show increase in concentration in this patient's blood serum?	Low-density lipoproteins	High-density lipoproteins	Fatty acid complexes with albumins	Chylomicrons	Cholesterol
515	1	A 70 year old man is ill with vascular atherosclerosis of lower extremities and coronary heart disease. Examination revealed disturbance of lipidic blood composition. The main factor of atherosclerosis pathogenesis is the excess of the following lipoproteins:	Low-density lipoproteins	Cholesterol	High-density lipoproteins	Intermediate density lipoproteins	Chylomicrons

516	1	Synthesis of phospholipids is disturbed as a result fatty infiltration of liver. Indicate which of the following substances can enhance the process of methylation during phospholipids synthesis?	Methionine	Ascorbic acid	Glucose	Glycerin	Citrate
517	1	The preventive radioprotector was given to a worker of a nuclear power station. What mechanism from the below mentioned is considered to be the main mechanism of radioprotection?	Inhibition of free radicals formation	Prevention of tissue's hypoxia	Activation of oxidation reactions	Increasing of tissue blood supply	Increasing of respiration
518	1	In course of metabolic process active forms of oxygen including superoxide anion radical are formed in the human body. By means of what enzyme is this anion inactivated?	Superoxide dismutase	Catalase	Peroxidase	Glutathionepero xidase	Glutathionered uctase
519	1	Patient with abscess of the cut wound applied to the traumatological department. In order to clean the wound from the pus doctor washed it with 3% hydrogen peroxide. Foam was absent. What caused the absence of the drug activity?	Inherited insufficiency of catalase	Low concentration H2O2	Inherited insufficiency of erythrocyte phosphatdehydrogen ase	Shallow wound	Pus in the wound
520	1	The process of metabolism in the human body produces active forms of oxygen, including superoxide anion radical. This anion is inactivated by the following enzyme:	Superoxide dismutase	Catalase	Peroxidase	Glutathione peroxidase	Glutathione reductase
521	1	Dietary fats after absorption appear in the circulation as:	Chylomicron	HDL	VLDL	LDL	Free fatty acid

522	1	Indicate which from listed below disorders of lipid metabolism occur in fat tissue:	Obesity	Steatorrhea	Ketosis	Retention hyperlipemia	Fatty infiltration of liver
523	1	Number of carbon atoms in cholesterol is:	27	17	19	30	35
524	1	The form in which most dietary lipids are packaged and exported from the intestinal mucosa cells is as follows:	Chylomicrons	Mixed micelles	Free triacylglycerol	2-monoacylglycerol	Free fatty acid
525	1	Chylomicron remnants are catabolised in:	Liver	Adipose tissue	Intestine	Liver and intestine	Kidneys
526	1	Obesity generally reflects excess intake of energy and is often associated with the development of	Non-insulin dependent diabetes mellitus	Nervousness	Hepatitis	Colon cancer	-
527	1	The rate limiting step in cholesterol biosynthesis is:	HMG CoA reductase	Squalene synthetase	HMG CoA synthetase	Mevalonate kinase	Geranyl transferase
528	1	Cholesterol is a starting material for biosynthesis of:	Cholic acid	N-acetyl-galactosamine	Lecithin	Prostaglandins	Sphingomyelin
529	1	Indicate lipid compound which is predominant in low density lipoprotein:	Cholesterol	Phospholipids	Triglycerides	Sphingomyelin	Glucocerebroside

530	1	The pathway of cholesterol synthesis begins from the next metabolite:	Acetyl-CoA	Succinyl-CoA	Acetoacetyl-CoA	2-Oxoglutaryl-CoA	Lauryl-CoA
531	1	Chose from listed below compounds the final product of cholesterol metabolism in human body:	Chenodeoxycholic acid	Cortisol	Prostaglandine E2	Cholecalciferol	Ergrosterol
532	1	Triglycerides are transported from liver to extrahepatic tissues by:	VLDL	Chylomicrons	HDL	LDL	IDL
533	1	Lipoproteins contain the following constituent:	Lecithin	Ca ions	Albumin	Blood plasma proteins	Bile acids
534	1	A compound normally used to conjugate bile acids is:	Glycine	Serine	Glucoronic acid	Fatty acid	-
535	1	This lipoprotein removes cholesterol from the body:	HDL	VLDL	IDL	Chylomicrons	LDL
536	1	Chylomicrons are present in fasting blood samples in hyperlipoproteinaemia of the following types:	Types I and V	Types IIa and IIb	Types I and IIa	Types IV and V	Types V and VI
537	1	Increase in blood of this class of lipoproteins is beneficial to ward off coronary heart disease:	HDL	LDL	VLDL	IDL	Chylomicrones
538	1	Note an intermediate metabolite which is on the cholesterol synthesis pathway and is of multifunctional significance:	β-Hydroxy β-methyl glutaryl-CoA (HMG-CoA)	Succinyl-CoA	Acetoacetate	Palmitoyl-CoA	2-Oxoglutaryl-CoA
539	1	The next compounds are intermediates in cholesterol synthesis pathway EXCEPT:	2-Oxoglutaryl-CoA	Mevalonic acid	Hydroxymethylglutaryl- CoA	Lanosterol	Squalene

540	1	A man 67 years old suffers from brain vessels atherosclerosis. After investigation hyperlipidemia was detected. What class of lipoproteins in blood plasma will be increased most of all in biochemical investigation?	LDL	HDL	Non esterified fatty acids in complex with albumin	Chilomicrons	VLDL
541	1	Chylomicron, intermediate density lipoproteins (IDL), low density lipoproteins (LDL) and very low density lipoproteins (VLDL) all are serum lipoproteins. What is the correct ordering of these particles from the lowest to the greatest density?	Chylomicron, VLDL, IDL, LDL	LDL, IDL, VLDL, Chylomicron	VLDL, IDL, LDL, Chylomicron	Chylomicron, IDL, VLDL, LDL	IDL, VLDL, LDL, Chylomicron
550	1	In a patient suffering from diabetes mellitus an increase in concentration of VLDL and triacylglycerols was detected. Cholesterol and HDL content are in normal values.What type of lipid metabolism disorder can be classified such changes of indicated data?	Hyperlipoproteinemia type IV	Hyperlipoproteinemia type II	Hyperlipoproteinemia type V	Hypelipoproteinemia type III	Hyperlipoproteinemia type II b
551	1	In a course of laboratory investigation of blood, taken in fasting conditions, it was detected the turbidity of serum, total lipids content – 20 g/l, cholesterol – 9 mM/l. After centrifugation on a surface of serum there appears a white film, which suggests an increase in the amount of chylomicrones in blood. What enzyme activity decrease may cause this situation?	Lipoproteine lipase of blood	Pancreatic phospholipases	Lecithine cholesterol acyl transferase	Lipases of fat tissue	Pancreatic lipase
552	1	A patient suffers from arterial hypertension due to atherosclerotic injury of blood vessels. The consumption of what dietary lipid needs to be limited?	Cholesterol	Oleic acid	Lecithine	Monooleateglycerol	Phosphatidylserine

553	1	Fats of phospholipids is disordered due to fat infiltration of the liver. Indicate which of the presented substances can enhance the process of methylation during phospholipids synthesis?	Methionine	Ascorbic acid	Glucose	Glycerin	Citrate
554	1	After investigation it was detected an increased content of low density lipoproteins in patient`s blood serum. What disease can be expected in this patient?	Atherosclerosis	Pneumonia	Gastritis	Acute pancreatitis	Kidney disease
555	1	A child 5 years old suffers from transient abdominal pains. Blood serum is turbid in fasting conditions. Cholesterol content – 4,3 mmoles/l, total lipids – 18 g/l. For precisement of diagnosis electrophoresis of blood lipoproteins is administered. What classes of lipoproteins are expected to be increased?	VLDL	HDL	IDL	LDL	Chylomicrons
556	1	In cases of complete or partial restriction of lipotropic factors in humans develops a fat degeneration of liver. What substances can be considered as lipotropic?	Choline	Pyridoxine	Fatty acids	Cholesterol	Triacylglycerols
557	1	A 44-year-old woman complains of common weakness, heart pain, considerable increase of body weigt. Objectively: moon-like face, hirsutism, AP- 165/100 mm Hg, height - 164 cm, weight - 103 kg; fat is mostly accumulated in the region of neck, upper shoulder girdle. What is the main pathogenetic mechanism of obesity?	Increased production of glucocorticoids	Decreased production of thyroidal hormones	Increased production of insulin	Decreased production of glucagon	Increased production of mineralocorticoids

558	1	The complaints and objective data permit to suppose an inflammatory process in gall bladder, disorder of colloidal properties of bile, probability of bile stones formation. What compound can cause their formation?	Cholesterol	Oxalates	Chlorides	Phosphates	Urates
559	1	In a worker of chemical cleaning the fatty liver dystrophy was recognized. What substance biosynthesis disorder can lead to this pathology?	Phosphatidyl choline	Tristearylglycer ol	Phosphatidic acid	Urea	Folic acid
560	1	A patient with high blood cholesterol levels was treated with lovastatin. This drug lowers blood cholesterol levels because it inhibits:	HMG CoA reductase in liver and peripheral tissue	Lipoprotein lipase in adipose tissue	Citrate lyase in liver	VLDL excretion by the liver	Absorption of dietary cholesterol
561	1	Laboratory investigation of the patient's blood plasma, which was performed 4 hours after a consumption of a fat diet, displayed a marked increase of plasma turbidity. The most credible cause of this phenomenon is the increase of in the plasma.	Chylomicrons	HDL	LDL	Cholesterol	Phospholi pids
562	1	Laboratory investigation of a patient revealed a high level of plasma LDL. What disease can be diagnosed?	Atherosclerosis	Nephropathy	Acute pancreatitis	Pneumonia	Gastritis
563	1	A person with a low-density lipoprotein (LDL) receptor deficiency was treated with lovastatin. As a consequence of the action of this drug, the person should have:	Lower blood cholesterol levels	Increased de novo cholesterol synthesis	Increased ACAT activity	Fewer LDL receptors in cell membranes	Higher blood triacylglycerol levels
564	1	A patient suffers from arterial hypertension due to atherosclerotic injury of blood vessels. The consumption of what dietary lipid needs to be limited?	Cholesterol	Oleic acid	Phosphatidylserine	Monooleateglyc erol	Lecithine

565	1	In metabolic transformations in human body appear active oxygen intermediates, including hydrogen peroxide. This substance is reduced by substrates as donor of hydrogen with the aid of the next enzyme:	Catalase	Cytochrome P-450	Glutathion peroxidase	Glutathion redsuctase	Superoxide dismutase
566	1	In a patient after the action of ionizing radiation an increased level of malonic dialdehyde was detected in blood, indicating the activation of peroxide oxidation of lipids. This may lead to injury of biological membranes due to:	Degradation of phospholipids	Oxidation of cholesterol	Changes in structure of transfer proteins	Breakdown of carbohydrate constituents	Activation of Na,K-ATPase
567	1	A teenage boy presents with moderate to severe epigastric pain. Physical examination reveals extensive eruptive xanthomas and hepatosplenomegaly. A blood sample reveals milky plasma. Which of the following is the most likely lipoprotein to be elevated in this patient's plasma?	Chylomicrons	Chylomicron remnants	HDL	IDL	LDL
568	1	A 45-year-old male patient presented with diarrhea and weight loss. He reported that his stools were loose, and odorous, particularly following large meals rich in fat.The insufficient secretion of what enzyme is the cause of incomplete fats degradation in the digestive tract and appearance of great quantity of neutral fats in feces?	Pancreatic lipase.	Phospholipase.	Entyrokinase.	Amylase.	Pepsin.

569	1	Monoamine oxidase inhibitors are widely used as psychopharmacological drugs. They change the level of nearly all neurotransmitters in synapses, with the following neurotransmitter being the EXEPTION:	Acetylcholine	Noradrenaline	Adrenaline	Dopamine	Serotonin
570	1	It is known that in catecholamine metabolism a special role belongs to monoamine oxidase (MAO). This enzyme inactivates mediators (noadrenalin, adrenalin, dopamine) by:	Oxidative deamination	Adjoining amino groups	Removing methyl groups	Carboxylation	Hydrolysis
571	1	A biochemical urine analysis has been performed for a patient with progressive muscular dystrophy. In the given case muscle disease can be confirmed by the high content of the following substance in urine:	Creatine	Porphyrin	Urea	Hippuric acid	Creatinine
572	1	Decarboxylation of glutamate induces production of gamma-aminobutyric acid (GABA) neurotransmitter. After breakdown, GABA is converted into a metabolite of the citric acid cycle, that is:	Succinate	Citric acid	Malate	Fumarate	Oxaloacetate
573	1	By the decarboxylation of glutamate in the CNS an inhibitory mediator is formed. Name it:	GABA	Glutathione	Histamine	Serotonin	Asparagine
574	1	A patient presents with dysfunction of cerebral cortex accompanied by epileptic seizures. He has been administered a biogenic amine synthetized form glutamate and responsible for central inhibition. What substance is it?	Gamma-amino butyric acid	Serotonin	Dopamine	Acetylcholine	Histamine

575	1	A male patient has been diagnosed with acute radiation disease. Laboratory examination revealed a considerable reduction of platelet serotonin level. The likely cause of platelet serotonin reduction is the disturbed metabolism of the following substance:	5-oxytryptophane	Tyrosine	Histidine	Phenylalanine	Serine
576	1	Pharmacological effects of antidepressants are based upon blocking (inhibiting) the enzyme that acts as a catalyst for the breakdown of biogenic amines noradrenalin and serotonin in the mitochondria of cephalic neurons. What enzyme takes part in this process?	Monoamine oxidase	Transaminase	Decarboxylase	Peptidase	Lyase
577	1	A 46-year-old female patient has a continuous history of progressive muscular (Duchenne's) dystrophy. Which blood enzyme changes will be of diagnostic value in this case?	Creatine phosphokinase	Lactate dehydrogenase	Pyruvate dehydrogenase	Glutamate dehydrogenase	Adenylate cyclase
578	1	During hypersensitivity test a patient got subcutaneous injection of an antigen which caused reddening of skin, edema, pain as a result of histamine action. This biogenic amine is generated as a result of transformation of the following histidine amino acid:	Decarboxylation	Methylation	Phosphorylation	Isomerization	Deaminization
579	1	A patient complained about dizziness, memory impairment, periodical convulsions. It was revealed that these changes were caused by a product of decarboxylation of glutamic acid. Name this product:	GABA	Pyridoxal phosphate	TDP	ATP	THFA

580	1	Examination of a patient suffering form cancer of urinary bladder revealed high rate of serotonin and hydroxyanthranilic acid. It is caused by excess of the following amino acid in the organism:	Tryptophan	Alanine	Histidine	Methionine	Tyrosine
581	1	On the ground of clinical presentations a patient was prescribed pyridoxal phosphate. This medication is recommended for correction of the following processes:	Transamination and decarboxylation of amino acids	Oxidative decarboxylation of ketonic acids	Desamination of purine nucleotides	Synthesis of purine and pyrimidin bases	Protein synthesis
582	1	A 9-month-old infant is fed with artificial formulas with unbalanced vitamin B6 concentration. The infant presents with pellagral dermatitis, convulsions, anaemia. Convulsion development might be caused by the disturbed formation of:	GABA	Histamine	Serotonin	DOPA	Dopamine
583	1	A patient with suspected diagnosis "progressing muscular dystrophy" got his urine tested. What compound will confirm this diagnosis if found in urine?	Creatine	Collagen	Porphyrin	Myoglobin	Calmodulin
584	1	In course of histidine catabolism a biogenic amin is formed that has powerful vasodilatating effect. Name it:	Histamine	Serotonin	Dioxyphenylalanine	Noradrenalin	Dopamine
585	1	Glutamate decarboxylation results in formation of inhibitory transmitter in CNS. Name it:	GABA	Glutathione	Histamine	Serotonin	Asparagine

586	1	A patient diagnosed with carcinoid of bowels was admitted to the hospital. Analysis revealed high production of serotonin. It is known that this substances is formed of tryptophane aminooacid. What biochemical mechanism underlies this process?	Decarboxylation	Desamination	Microsomal oxydation	Transamination	Formation of paired compounds
587	1	According to clinical indications a patient was administered pyridoxal phosphate. What processes is this medication intended to correct?	Transamination and decarboxylation of aminoacids	Oxidative decarboxylation of ketonic acids	Desamination of purine nucleotide	Synthesis of purine and pyrimidine bases	Protein synthesis
588	1	A patient with serious damage of muscular tissue was admitted to the traumatological department. What biochemical urine index will be increased in this case?	Creatinine	Common lipids	Glucose	Mineral salts	Uric acid
589	1	What is the number of amino acids involved in protein biosynthesis?	Twenty	Twelve	Twenty five	Fifteen	Thirty seven
590	1	A polypeptide is shown to have a high pI value (approx. at pH 8,9). What from listed below amino acids is responsible for this property?	Arginine	Valine	Serine	Tyrosine	Cysteine
591	1	Denaturation of proteins is caused by:	Alteration of polypeptide chain folding (conformation)	Hydrolytic cleavage of peptide bonds	Reduction and cleavage of disulphide bonds	Formation of new peptide bonds	Dissotiation of carboxyl groups
592	1	Sequence of amino acids in polypeptide chain is defined as the next structural level:	Primary	Secondary	Tertiary	Quaternary	Multimolecular complex
593	1	Note the correct value of normal protein concentration in human blood plasma:	65-85 g/l	25-40 g/l	45-60 g/l	85-100 g/l	100-150 g/l

594	1	In proteins amino acids are linked covalently by:	Peptide bonds	Hydrogen bonds	Disulphide bonds	Hydrophobic interactions	Salt like bridges
595	1	Protein is a biopolymer which can be defined as:	Linear chain of L-amino acids	Branched chain of mononucleotides	Linear chain of amino sugars	Linear chain of nucleosides	Branched chain of D-amino acids
596	1	The net charge of protein molecule depends from the next factors:	Amino acid composition	pH value of solution	Conformation of protein molecule	Quaternary structure of protein	Hydrophobic interactions between amino acid residues
597	1	Disulphide bridge in protein molecules is formed between the next amino acids:	Cysteine-cysteine	Lysine-aspartic acid	Tyrosine - histidine	Proline-tryptophan	Histidine-arginine
598	1	Glutathion is a tripeptide possessing reducing properties. What amino acid residue is responsible for reductive properties of glutathion?	Cysteine	Glutamic acid	Glycine	Valine	Aspartic acid
599	1	Which of the following is a tripeptide?	Glutathione	Anserine	Oxytocin	Glucagon	Kallidin
600	1	In a child, consuming meal of plant origin for a long time growth retardation, anemia, liver and kidney impairment were observed. The cause of such state is deficiency in diet of the next nutrients:	Essential amino acids	Lipids	Carbohydrates	Mineral macroelements	Carotene
601	1	Pyruvic acid can be obtained by transamination of alanine with:	α- ketoglutaric acid	Acetoacetic acid	α- OH butyric acid	Phosphoenol Pyruvic acid	Fumaric acid

602	1	The product of glutamate decarboxylation is:	Gamma-amino butyrate	Putrescine	Taurine	Oxaloacetate	α-Ketoglutarate
603	1	A vasodilating compound is produced by the decarboxylation of the amino acid:	Histidine	Aspartic acid	Glutamine	Arginine	Glutamic acid
604	1	An important reaction for the synthesis of amino acid from carbohydrate intermediates is transamination which requires the cofactor:	Pyridoxal phosphate	Riboflavin	Niacin	Thiamin	Folic acid
605	1	Which of the following enzymes catalyses reactions in the biosynthesis of both catecholamines and indoleamines (serotonin)?	Aromatic amino acid decarboxylase	Dopamine β-hydroxylase	Phenylethanolamine N-methyltransferase	Tryptophan hydroxylase	Tyrosine hydroxylase
606	1	The amino acids involved in the synthesis of creatin are:	Arginine, glycine, active methionine	Arginine, alanine, glycine	Glycine, lysine, methionine	Arginine, lysine, methionine	Glycine, lysine, alanine
607	1	Note amino acids, which are participants of creatine biosynthesis:	Arginine	Lysine	Methionine	Tryptophan	Phenylalanine
607	1	The amino acid that undergoes oxidative deamination at significant rate is:	Glutamate	Aspartate	Alanine	Glutamine	Serine
608	1	In recognition of hepatitis the determination the following enzymes activity in blood has diagnostic significance:	Amino transferases	Amylase	Lactate dehydrogenase	Aldolase	Creatin kinase

609	1	An unusually active amine, a mediator of inflammation and allergy, appears via decarboxylation of histidine. Which of the following is it?	Histamine	Serotonin	Dopamine	γ-Aminobutyrate	Tryptamine
610	1	Aminotransferases as a coenzyme contain:	Derivative of pyridoxine	Thiamine	α-Ketoglutarate	Coenzyme A	Ubiquinone
611	1	Which amino acid is a lipotropic factor?	Methionine	Leucine	Tryptophan	Lysine	Tyrosine
612	1	Deamination of glutamate is catalysed by:	Glutamate dehydrogenase	Alanine aminotransferase	Glutamate decarboxylase	Pyruvate carboxykinase	Glutamate oxidase
613	1	Biogenic amine serotonine is produced by decarboxylation of the next amino acid:	Tryptophane	Lysine	Histidine	Arginine	Tyrosine
614	1	Glutathione is a:	Tripeptide	Dipeptide	Polypeptide	Pentapeptide	Amino acid
615	1	In metabolic point of view, amino acids are classified as:	Glycogenic or ketogenic	Cyclic and non cyclic	Polar and nonpolar	Essential and nonessential	All of these

616	1	High levels of serotonin and 3-oxianthranilate are revealed in the blood of a patient suffering from urinary bladder cancer. By the disturbance of the metabolism of what amino acid is it caused?	Tryptophan	Alanine	Histidine	Methionine	Tyrosine
617	1	Biochemical function of glutathion in an organism is connected with reduction and detoxification of organic peroxides. During an interaction of glutathion with hydroperoxides harmless organic alcohols are formed with subsequent further oxidation. Indicate an amino acid composing glutathion.	Glutamate	Valine	Lysine	Isoleucine	Tryptophan
618	1	A patient with a cranial trauma manifests repeated epileptoid seizures. The biosynthesis of what biogenic amine is disturbed in this clinical situation?	GABA	Histamine	Adrenaline	Serotonin	Dopamine
619	1	12 hours after an accute attack of retrosternal pain a patient presented a jump of aspartate aminotransferase activity in blood serum. What pathology is this deviation typical for?	Myocardium infarction	Viral hepatitis	Collagenosis	Diabetes mellitus	Diabetes insipidus
620	1	In experimental animals hold prolonged time on protein free diet, a fat degeneration of liver has been developed. The possible cause may be insufficiency of methylating agents. Indicate an amino acid, donor of methyl groups:	Methionine	Phenylalanine	Lysine	Cysteine	Arginine

621	1	The product of oxidase reactions is hydrogen peroxide, a very toxic substance for cells. An important role in its reduction plays glutathion. Indicate an amino acid present in glutathion structure.	Cysteine	Serine	Alanine	Aspartate	Thyrosine
622	1	Biogenic amines, namely histamine, serotonin, dopamine etc., are very active substances that affect markedly various physiological functions of the organism. What biochemical process is the principal pathway for biogenic amines production in body tissues?	Decarboxylation of amino acids	Deamination of amino acids	Transamination of amino acids	Oxidation of amino acids	Reductive animation
623	1	In diagnostics of an acute viral hepatitis estimation of the next enzymatic activity in blood serum is the most valuable:	Alanyl aminotransferase	Glutathion peroxidase	Creatine kinase	Amylase	Alkaline phosphatase
624	1	In psychiatric practice, biogenic amines and their derivatives arc used for the treatment of certain diseases of the central nervous system. Name the substance of the mentioned below biochemical class which acts as an inhibitory mediator.	GABA	Histamine	Serotonin	Dopamine	Taurine
625	1	In human body are synthesized 10 amino acids only from 20 ones needed for protein biosynthesis. What amino acid from listed below is produced in human body?	Tyrosine	Histidine	Lysine	Methionine	Phenylalanine
626	1	In clinical practice for parentheral nutrition a protein hydrolysate is used. Amino acid constituents of such hydrolysate were separated with the aid of paper chromatography into acidic and basic. Chose an acidic amino acid from listed below:	Aspartate	Threonine	Serine	Glycine	Lysine

627	1	A 7-year-old child was admitted to an emergency clinic in the state of allergic shock provoked by a wasp sting. High concentration of histamine was determined in the patient's blood. Which biochemical reaction leads to the production of this amine?	Decarboxylation	Hydroxylation	Dehydration	Deamination	Reduction
628	1	Production of some toxic substances in large intestines occurs due to decarboxylation of some amino acids. Indicate, what substance is produced from ornithine?	Putrescin	Scatole	Indole	Cadaverine	Phenol
629	1	An unconscious patient was delivered by ambulance to the hospital. On objective examination the patient was found to present no reflexes, periodical convulsions, irregular breathing. After laboratory examination the patient was diagnosed with hepatic coma. Disorders of the central nervous system develop due to accumulation of the following metabolite:	Ammonia	Urea	Glutamine	Bilirubin	Histamine
630	1	A patient with hereditary hyperammonemia due to a disorder of ornithine cycle has developed secondary orotaciduria. The increased synthesis of orotic acid is caused by an increase in the following metabolite ofornithine cycle:	Carbamoyl phosphate	Citrulline	Ornithine	Urea	Argininosuccinate
631	1	After severe viral hepatitis a 4 year old boy presents with vommiting, occasional loss of consciousness, convulsions. Blood test revealed hyperammoniemia. Such condition is caused by a disorder of the following biochemical hepatic process:	Disorder of ammonia neutralization	Disorder of biogenic amines neutralization	Protein synthesis inhibition	Activation of amino acid decarboxylation	Inhibition of transamination enzyme

632	1	The greater amount of nitrogen is excreted from the organism in form of urea. Inhibition of urea synthesis and accumulation of ammonia in blood and tissues are induced by the decreased activity of the following liver enzyme:	Carbamoyl phosphate synthetase	Aspartate aminotransferase	Urease	Amylase	Pepsin
633	1	A newborn child was found to have reduced intensity of sucking, frequent vomiting, hypotonia. Urine and blood exhibit increased concentration of citrulline. What metabolic process is disturbed?	Ornithinic cycle	Tricarboxylic acid cycle	Glycolysis	Glyconeogenesis	Cori cycle
634	1	A cerebral trauma caused increased ammonia generation. What amino acid participates in the excretion of ammonia from the cerebral tissue?	Glutamic	Tyrosine	Valine	Tryptophan	Lysine
635	1	Ammonia is a very toxic substance, especially for nervous system. What substance takes the most active part in ammonia detoxication in brain tissues?	Glutamic acid	Lysine	Proline	Histidine	Alanine
636	1	A 4 y.o. boy has had recently serious viral hepatitis. Now there are such clinical presentations as vomiting, loss of consciousness, convulsions. Blood analysis revealed hyperammoniemia. Disturbunce of which biochemical process caused such pathological condition of the patient?	Disturbed neutralization of ammonia in liver	Disturbed neutralization of biogenic amines	Increased putrefaction of proteins in bowels	Activation of aminoacid decarboxylation	Inhibition of transamination enzyme

637	1	After a serious viral infection a 3-year-old child has repeated vomiting, loss of consciousness, convulsions. Examination revealed hyperammoniemia. What may have caused changes of biochemical blood indices of this child?	Disorder of ammonia neutralization in ornithinic cycle	Activated processes of aminoacids decarboxylation	Disorder of biogenic amines neutralization	Increased purtefaction of proteins in intestines	Inhibited activity of transamination enzyme
638	1	Patient presents all signs of the hepatic coma: loss of consciousness, absence of reflexes, cramps, convulsion, disorder of heart activity, recurrent (periodical) respiration. What are cerebrotoxical substances which accumulate in blood under hepar insufficiency?	Ammonia	IL-1	Autoantibody	Necrosogenic substances	Ketone bodies
639	1	A 2 year old child with mental and physical retardation has been delivered to a hospital. He presents with frequent vomiting after having meals. There is phenylpyruvic acid in urine. Which metabolism abnormality is the reason for this pathology?	Amino-acid metabolism	Lipidic metabolism	Carbohydrate metabolism	Water-salt metabolism	Phosphoric calcium metabolism
640	1	A 1,5-year-old child presents with both mental and physical lag, decolorizing of skin and hair, decrease in catecholamine concentration in blood. When a few drops of 5% solution of trichloroacetic iron has been added to the child’s urine it turned olive green. Such alteration are typical for the following pathology of the amino acid metabolism:	Phenylketonuria	Alkaptonuria	Tyrosinosis	Albinism	Xanthinuria

641	1	In case of alkaptonuria, homogentisic acid is excreted in urine in large amounts. The development of this disease is associated with metabolic disorder of the following amino acid:	Tyrosine	Phenylalanine	Alanine	Methionine	Asparagine
642	1	A patient with homogentisuria has signs of arthritis, ochronosis. In this case, the pain in the joints is associated with the deposition of:	Homogentisates	Urates	Phosphates	Oxalates	Carbonates
643	1	A patient has been diagnosed with alkaptonuria. Choose an enzyme that can cause this pathology when deficient:	Homogentisic acid oxidase	Phenylalanine hydroxylase	Glutamate dehydrogenase	Pyruvate dehydrogenase	Dioxyphenylalanine decarboxylase
644	1	Nappies of a newborn have dark spots being the evidence of homogentisic acid formation. This is caused by the metabolic disorder of the following substance:	Tyrosine	Galactose	Methionine	Cholesterol	Tryptophan
645	1	Albinos can’t stand sun impact – they don’t aquire sun-tan but get sunburns. Disturbed metabolism of what aminoacid underlies this phenomenon?	Phenilalanine	Methionine	Tryptophan	Glutamic acid	Histidine
646	1	Laboratory examination of a child revealed increased concentration of leucine, valine, isoleucine and their ketoderivatives in blood and urine. Urine smelt of maple syrup. This disease is characterized by the deficit of the following enzyme:	Dehydrogenase of branched amino acids	Aminotransferase	Glucose-6-phosphatase	Phosphofructokinase	Phosphofructomutase
647	1	A baby refuses the breast, he is anxious, presents with arrhythmic respiration. The urine smells of "brewer’s yeast"or "maple syrup". This pathology was caused by the inherited defect of the following enzyme:	Dehydrogenase of branched-chain alpha-keto acids	Glucose 6-phosphate dehydrogenase	Glycerol kinase	Aspartate aminotransferase	UDP-glucuronil transferase

648	1	The main site of urea synthesis in mammals is:	Liver	Skin	Intestine	Kidney	Heart
649	1	The enzymes of urea synthesis are found in:	Both mitochondria and cytosol	Mitochondria only	Cytosol only	Nucleus	Peroxisomes
650	1	The number of ATP required for urea synthesis is:	3	1	2	0	7
651	1	Most of the ammonia released from L-α-amino acids reflects the coupled action of transaminase and:	L-glutamate dehydrogenase	L-amino acid oxidase	Histidase	Serine dehydratase	-
652	1	In urea synthesis, the amino acid functioning solely as an enzyme activator:	N-acetyl glutamate	Ornithine	Citrulline	Arginine	Urea
653	1	Albinos become tanned poorly, instead they get sunburns. The disorder of what amino acid metabolism causes this phenomenon?	Tyrosine	Methionine	Tryptophan	Glutamine	Histidine
654	1	In a child in urine were detected phenylpyruvate and phenylacetate. What enzyme insufficiency causes this phenomenon?	Phenylalanine-4-monooxygenase	Thyrosine-3-monooxygenase	Fumarylacetoacetate hydrolase	Cystathionyl-β-synthase	DOPA-decarboxylase
655	1	The principal end product of protein metabolism, which is excreted in the greatest quantity in human urine, is:	Urea	Glutamin	Ammonium and its salts	Uric acid	Allantoin

656	1	Indicate enzymes belonging to ornitine cycle of urea synthesis:	Carbamoylphosphate synthetase	Ornitine decarboxylase	Glutamatdehydrogenase	Argininosuccinate dehydrogenase	Enolase
657	1	What chemical component in urine indicates on a hereditary metabolic disease alkaptonuria?	Homogentisic acid	Phenylalanine	Phenylpyruvic acid	Pyruvic acid	Tyrosine
658	1	In mammalian tissues serine can be a biosynthetic precursor of:	Glycine	Methionine	Tryptophan	Phenylalanine	Tyrosine
659	1	Amount of phenylacetic acid excreted in the urine in phenylketonuria is	290–600 mg/dL	200–280 mg/dL	100–200 mg/dL	600–750 mg/dL	750– 1000 mg/Dl
660	1	Tyrosinosis is due to defect in the enzyme:	Tyrosine transaminase	p-Hydroxyphenyl pyruvate hydroxylase	Fumarylacetoacetate hydrolase	Tyrosine hydroxylase	Phenylalanine-4-monooxygenase
661	1	An important finding in glycinuria is:	Excess excretion of oxalate in the urine	Deficiency of enzyme glycinase	Significantly increased serum glycine level	Defect in renal tubular reabsorption of glycine	-
662	1	An important feature of maple syrup urine disease is:	Blood levels of leucine, isoleucine and serine are increased	Without treatment death, of patient may occur by the end of second year of life	Patient can not be treated by dietary regulation	Excessive brain damage	-

663	1	Ochronosis is an important finding of:	Alkaptonuria	Tyrosinosis	Tyrosinemia	Richner Hanhart syndrome	Homocystinuia
664	1	In albinism there is negative reaction to direct insolation, as a result solar burns may appear. Metabolic disorders of what amino acid cause these effects?	Tyrosine	Tryptophan	Methionine	Glutamic acid	Histidine
665	1	Transfer of the carbamoyl moiety of carbamoyl phosphate to ornithine is catalysed by a liver mitochondrial enzyme:	Ornithine transcarbamoylase	Carbamoyl phosphate synthetase I	N-acetyl glutamate synthetase	N-acetyl glutamate hydrolase	Carbamoyl phosphate synthetase II
666	1	A compound serving a link between citric acid cycle and urea cycle is	Fumarate	Citrate	Succinate	Malate	Acetyl-S-CoA
667	1	In humann body is degraded approximately 70 g of amino acids daily. The main end product of nitrogen metabolism in human is:	Urea	Ammonia	Uric acid	Glutamine	Creatinine
668	1	Choose characteristic features of phenylketonuria:	Deficiency of phenylalanine hydroxylase	Excretion of enhanced quantity of homogentisate with urine	Absence of pigments in the skin, hair, cornea	Deficiency of oxidase of homogentisic acid	Deficiency of tyrosinase activity
669	1	What is the principal final nitrogen containing product of protein catabolism in human body?	Urea	Glutamine	Ammonia and ammonium ion	Creatinin	Uric acid
670	1	The amino acid which detoxicated benzoic acid to form hippuric acid is:	Glycine	Alanine	Serine	Glutamic acid	Valine

671	1	Indicate amino acid which is a precursor of the thyroid hormones thyroxine and triiodothyronine.	Tyrosine	Histidine	Tryptophan	Glycine	Glutamate
672	1	Ammonia is transported from muscles to liver mainly in the form of:	Glutamine	Alanine	Asparagine	Free ammonia	Glutamate
673	1	ATP is required in following reactions of urea cycle:	Synthesis of carbamoyl phosphate and argininosuccinate	Synthesis of citrulline and argininosuccinate	Synthesis of argininosuccinate and arginine	Synthesis of carbamoyl phosphate and citrulline	-
674	1	Maple syrup urine diseases is an inborn error of metabolism of:	Branched chain amino acids	Aromatic amino acids	Sulphur-containing amino acids	Dicarboxylic amino acids	Proline
675	1	An individual who consumed 100 g of protein losses 13,5 g of nitrogen in the urine, 2 g in the feces, and 0,5 g by other routes. This individual can be suggested as:	A normal, healthy adult	A woman in her eight month of pregnancy	A 6 year-old child	Recovering from major surgery	Consuming a diet consistently deficient in lysine
676	1	A newborn child rejects breast feeding, he is restless, his breathing is unrhythmical, and the urine has a specific smell of beer ferment or maple syrup. The innate defect of what enzyme causes this pathology?	Dehydrogenase of branched-chan α-keto acids	Glucose-6-phosphate dehydrogenase	Glycerol kinase	Aspartate aminotransferase	UDP-glucuronyltransferase
677	1	Under alcaptonuria, the excessive quantity of homogentisate was found in the patient's urine (the urine darkens in the air). The innate defect of what enzyme is apparent?	Homogentisate oxidase	Alanine aminotransferase	Tyrosinase	Phenylalanine-4-monooxygenase	Tyrosine aminotransferase

678	1	13 years old patient complains of general weakness, dizziness, fatigue. Besides this mental underdevelopement is observed. Laboratory investigations revealed high content of valine, isoleucine and leucine in urine, which has a characteristic odor. What is the most probable cause of this condition?	Maple syrup syndrome	Cystinosis	Phenylketonuria	Porphyria	Hyperuricemia (gout)
679	1	In a young child besides other clinical symptoms the sharp darkening of urine after standing in open air was revealed. Blood and urine examination detected the presence of homogentisic acid. What is the most probable cause of disease?	Alkaptonuria	Porphyria	Albinism	Cystinuria	Hemolytic anemia
680	1	An infant shows the darkening of scleras, mucous membranes. The excreted urine darkens in tin air, homogentistic acid is determined both in the blood and urine. What is the diagnosis?	Alkaptonuria	Albinism	Cystinuria	Porphyria	Hemolytic anemia
681	1	In two years old boy suffering from alkaptonuria urine became black after standing. This disease is hereditary disorder of:	Thyrosine metabolism	Alanine metabolism	Urea synthesis	Uric acid synthesis	Cystein metabolism
682	1	Laboratory analysis of the urine of a six-day infant displayed excessive concentration of phenylpyruvate and phenylacetate. Metabolism of what amino acid is disturbed in the body of this child?	Phenylalanine	Tryptophan	Methionine	Histidine	Arginine

683	1	A 9-year-old boy was brought to a hospital with signs of mental and physical retardation. A biochemical blood test revealed the increased level of phenylalanine. The blockage of what, enzyme can result in such state of the patient?	Phenylalanine-4-monooxygenase	Homogentisate oxidase	Glutamine transaminase	Aspartate aminotransferase	Glutamate decarboxylase
684	1	In a patient suffering from liver cirrhosis a decrease in urea concentration in blood serum was detected. This may be caused by:	Disorder of urea synthesis in liver	Absense of alanine aminotransferase activity in hepatocytes	Deficiency of ammonia for urea synthesis	Deficiency of CO2 for urea synthesis	Excess of ammonia blocking enzymes of urea synthesis
685	1	Ammonia is a very poisonous chemical, especially for the nervous system. What substance takes a particularly active part in the detoxification of ammonia in the brain tissue?	Glutamic acid	Lysine	Proline	Histidine	Alanine
686	1	Under the repeated action of ultraviolet rays, skin darkens because of the synthesis of melanin which protects cells from damage. The principal mechanism of this defence reaction is:	Activation of tyrosinase	Inhibition of tyrosinase	Activation of homogentisate oxidase	Inhibition of homogentisate oxidase	Inhibition of phenylalanine hydroxylase
687	1	A mother of a 5-year-old child has noticed that the child's urine is too dark. The child does not have any complaints. Bile pigments are not present in the urine. The diagnosis of alcaptonuria is set. The deficiency of what enzyme is observed in this case?	Homohentisate oxidase	Phenylalanine hydroxylase	Tyrosinase	Oxyphenyl pyruvate oxidase	Decarboxylase of phenylpynivate
688	1	A citrulline and a high level of ammonia are determined in the urine of a newborn child. The formation of what substance is the most credible to be disturbed?	Urea	Uric acid	Ammonia	Creatinine	Creatine

689	1	A 13-year-old patient complains of general weakness, rapid fatigue. There is retardation in his mental development. Laboratory investigation revealed high concentrations of valine, isoleucine and leucine in his blood and urine. The urine has a specific smell. What can the cause of such state be?	Maple syrup disease	Addison's disease	Tyrosinosis	Histidinemia	Diffuse toxic goiter
690	1	A ten-month-old child, whose parents are dark-haired, is fair-haired, fair-complexioned, and blue-eyed. The neonate seemed to be healthy, but during the last three months the cerebral circulation disorder and the retardation of mental development appeared. The cause of such state is:	Phenylketonuria	Galactosemia	Glycogenosis	Acute porphyria	Histidinemia
691	1	The signs of skin depigmentation of a 19-year-old patient are caused by the disorder of melanin synthesis. The disturbance of the metabolism of what amino acid is it caused by?	Tyrosine	Tryptophan	Histamine	Proline	Lysine
692	1	One of the forms of innate human pathology is accompanied by the blockage of the conversion of phenylalanine into tyrosine. The biochemical manifestation of the disease is the accumulation of certain organic acids in the organism including:	Phenylpyruvate	Citrate	Pyruvate	Lactate	Glutamate
693	1	A newborn child has dark coloring of scleras and mucous membranes. The excreted urine darkens in the air. Laboratory tests of blood and urine have revealed the occurrence of homogentisic acid. What can the cause of this state be?	Alcaptonuria	Albinism	Galactosemia	Cystinuria	Histidinemia

694	1	Affected by ultraviolet radiation, human skin darkens, which is a protective reaction of the organism. What protective substance, namely amino acid derivative, is synthesized in the cells under these conditions?	Melanin	Arginine	Methionine	Phenylalanine	Thyroxin
695	1	In a child with functional disorders of central nervous system during biochemical investigation were detected hyperammonemia. Preliminary diagnosis – hereditary hyperammoniemia due to disorder of urea synthesis. What enzymopathia can cause this disease?	Ornithine transcarbamoylase	Gluthation transferase	Sulfotransferase	Glycyl transferase	Glucuronyl transferase
696	1	A polypeptide is shown to have a high pI value (approx. at pH 8,9). What from listed below amino acids is responsible for this property?	Arginine	Valine	Serine	Tyrosine	Cysteine
697	1	Disulphide bridge in protein molecules is formed between the next amino acids:	Cysteine-cysteine	Lysine-aspartic acid	Tyrosine - histidine	Proline-tryptophan	Histidine-arginine
698	1	A disulphide bond can be formed between:	Two cysteine residues	Two methionine residues	A methionine and a cysteine residue	Two serine residues	Two valine residues
699	1	Which amino acid is a lipotropic factor?	Methionine	Leucine	Tryptophan	Lysine	Tyrosine
700	1	Biogenic amine serotonine is produced by decarboxylation of the next amino acid:	Tryptophane	Lysine	Histidine	Arginine	Tyrosine

701	1	What amino acid from listed below participates in biosynthesis of heme?	Glycine	Aspartic acid	Methionine	Histidine	Phenylalanine
702	1	Increased urinary indole acetic acid is diagnostic of:	Hartnup disease	Maple syrup urine disease	Homocystinuria	Phenylketonuria	Alcaptonuria
703	1	As a result of tryptophan hydroxylation in presence of tryptophan-5-monoaxygenase is produced:	Serotonin	Histamine	Dopamine	Melanin	Adrenalin
704	1	Tryptophan could be considered as a precursor of:	Melanotonin	Thyroid hormones	Melanin	Epinephrine	Insuline
705	1	High levels of serotonin and 3-oxianthranilate are revealed in the blood of a patient suffering from urinary bladder cancer. By the disturbance of the metabolism of what amino acid is it caused?	Tryptophane	Alanine	Histidine	Methionine	Tyrosine
706	1	In experimental animals hold prolonged time on protein free diet, a fat degeneration of liver has been developed. The possible cause may be insufficiency of methylating agents. Indicate an amino acid, donor of methyl groups	Methionine	Phenylalanine	Lysine	Cysteine	Arginine

707	1	Patients with erythropoietic porphyria (Gunther's disease) have teeth that fluoresce with bright red colon when subjected to ultraviolet radiation; their skin is light-sensitive, urine is red-colored. What enzyme can cause this disease, when it is deficient?	Uroporphyrinogen III cosynthase	Uroporphyrinogen I synthase	Delta-aminolevulinate synthase	Uroporphyrinogen decarboxylase	Ferrochelatase
708	1	A male patient has been diagnosed with acute radiation disease. Laboratory examination revealed a considerable reduction of platelet serotonin level. The likely cause of platelet serotonin reduction is the disturbed metabolism of the following substance:	5-oxytryptophane	Tyrosine	Histidine	Phenylalanine	Serine
709	1	A patient has pellagra. Interrogation revealed that he had lived mostly on maize for a long time and eaten little meat. This disease had been caused by the deficit of the following substance in the maize:	Tryptophane	Tyrosine	Proline	Alanine	Histidine
710	1	Urine analysis of a 12-year-old by reveals high concentration of all aliphatic amino acids with the highest excretion of cystine and cysteine. US of kidneys revealed kidney concrements. What is the most likely pathology?	Cystinuria	Alkaptonuria	Cystitis	Phenylketonuria	Hartnup disease
711	1	Examination of a patient suffering form cancer of urinary bladder revealed high rate of serotonin and hydroxyanthranilic acid. It is caused by excess of the following amino acid in the organism:	Tryptophan	Alanine	Histidine	Methionine	Tyrosine

712	1	A mother consulted a doctor about her 5-year-old child who develops erythemas, vesicular rash and skin itch under the influence of sun. Laboratory studies revealed decreased iron concentration in the blood serum, increased uroporphyrinogen I excretion with the urine. What is the most likely inherited pathology in this child?	Erythropoietic porphyria	Methemoglobinemia	Hepatic porphyria	Coproporphyria	Intermittent porphyria
713	1	A patient, who suffers from congenital erythropoietic porphyria, has skin photosensitivity. The accumulation of what compound in the skin cells can cause it?	Uroporphyrinogen I	Protoporphyrin	Uroporphyrinogen II	Coproporphyrinogen III	Heme
714	1	Symptoms of pellagra (vitamin PP deficiency) is particularly pronounced in patients with low protein diet, because nicotinamide precursor in humans is one of the essential amino acids, namely:	Tryptophane	Threonine	Arginine	Histidine	Lysine
715	1	Indicate the key function of mRNA	Transfers genetic information from genes to ribosomes for biosynthesis of proteins	Transfers amino acids to ribosomes for biosynthesis of proteins	Provides structural frameworks for the ribosomes	Plays a key role in the processing of rRNA molecules	Involved in the selection of proteins for their export
716	1	The 3'-terminal end of mRNA contains a polymer of adenylate residues (20-250 nucleotides) which is known as poly (A) tail. This tail is responsible for …	Providing stability to mRNA, preventing it from the attack of 3'-exonucleases;	Formation of RNA-DNA complex;	Recognition by RNA polymerase;	Formation of promotor;	Termination of transcription

717	1	Ribonuclease P (RNase P) is a ribozyme containing protein and RNA component. Explain biological significance of RNase P in eukaryotic cells.	It cleaves tRNA precursors to generate mature tRNA molecules	It cleaves DNA-RNA complexes	It participates in splicing	It activates translation	It terminates translation
718	1	Indicate the main function of tRNA.	Transfers amino acids to ribosomes for biosynthesis of proteins	Involved in mRNA processing	Provides structural frameworks for the ribosomes	Plays a key role in the processing of rRNA molecules	Transfers genetic information from genes to ribosomes for biosynthesis of proteins
719	1	Orotic aciduria is a rare metabolic disorder characterized by the excretion of orotic acid in urine, severe anemia and retarded growth. lt is due to the deficiency of the next enzyme…	Orotate phosphoribosyl transferase	Xanthine oxidase	HGPRT	Dihidroorotase	Carbamoyl phosphate synthetase II
720	1	Indicate the type of regulation of PRPP glutamyl amidotransferase during purine biosynthesis.	Feedback inhibition	Covalent modification	Allosteric regulation	Reversible inhibition	Postranscriptional regulation
721	1	Indicate enzyme that catalase the reaction of the “committed step” in purine nucleotide biosynthesis.	PRPP glutamyl amidotransferase	PRPP synthetase	Formyltransferase	Cyclohydrolase	Adenosuccinate lyase
722	1	What is the major site for purine nucleotide synthesis?	Liver	Erythrocytes	Brain	Kidneys	Muscles
723	1	Biosynthesis of purines does not occur in…	Erythrocytes	Liver	Kidneys	Intestine	Muscles

734	1	The synthesis of purine and pyrimidine deoxyribonucleotides occurs from ribo-nucleotides by a reduction at the C2 position of ribose moiety. This reaction is catalysed by…..	Ribonucleotide reductase.	PRPP glutamyl amidotransferase	Formyltransferase	Xanthine oxidase	PRPP synthetase
735	1	The nitrogen atoms in the purine ring are obtained from ____?	All of them.	Aspartate	Clutamine	Glycine	CO_2
736	1	The synthesis of new DNA strand during replication continues till it is in close proximity to RNA primer. Which enzyme removes the RNA primer during replication?	DNA polymerase I	DNA polymerase II	DNA polymerase III	Topoizomerase	RNA polymerase
737	1	As the double helix of DNA separates from one side and replication proceeds, supercoils are formed at the other side. The problem of supercoils that comes in the way of DNA replication is solved by a group of enzymes called …	DNA topoisomerases	DNA ligases	DNA polymerases	SSB proteins	RNA primases
738	1	Find from the list a potent inhibitor of replication in prokaryotes.	Nalidixic acid	Streptomycin	Tetracycline	Rifampicin	Actinomycin D
739	1	Certain compounds that inhibit human topoisomerases are used as anticancer agents. Find from the list a potent inhibitor of replication in eukaryotes.	Doxorubicin	Nalidixic acid	Streptomycin	Tetracycline	Rifampicin
740	1	Nowadays inhibitors of topoisomerase are widely used in chemical therapy. They…	Block the unwinding of parental DNA strands and prevent replication.	Inhibit functions of SSB proteins	Cleave RNA primers	Degradate DNA polymerase	Activate recombination processes

741	1	The exchange of genetic information between identical or nearly identical DNA fragments (sequences) is known as…	Homologous recombination	Non-homologous recombination	Alternative splicing	DNA attenuation	DNA synteny
742	1	Xeroderma pigmentosum (XP) is a rare autosomal recessive disease. The affected patients are photosensitive and susceptible to s kin cancers. What is a metabolic reason of XP?	A defect in the nucleotide excision repair of the damaged DNA	Increased resistance to anticancer drugs	Mutation in DNA ligase gene	Inhibition of replication	DNA degradation.
743	1	Enhancers can increase gene expression. This is made possible by binding of enhancers to transcription factors to form ___	Activators	Transposons	Inhibitors	Promoters	Silencers
744	1	The 5' end of mRNA is capped with 7-methylguanosine by an unusual 5'-5' triphosphate linkage. Which compound is used as a donor of methyl group for 7-methylguanosine	S-Adenosylmethionin	N5-methyl-THF	Acetyl CoA	Methanol	Thioredoxin
745	1	A large number of compounds are used as inhibitors of transcription. Indicate mechanism of action of Actinomycin D. It	binds with DNA template strand and blocks the movement of RNA polymerase	binds to promoter regions and blocks activation of transcription	inhibits termination of transcription	cleaves RNA polymerase	cleaves RNA
746	1	A large number of compounds are used as inhibitors of transcription. Indicate mechanism of action of Rifampin. It …	binds with the β-subunit of prokaryotic RNA polymerase and inhibits its activity	binds with DNA template strand and blocks the movement of RNA polymerase	binds to promoter regions and blocks activation of transcription	inhibits termination of transcription	cleaves RNA

747	1	A large number of compounds are used as inhibitors of transcription. Indicate mechanism of action of α-Amanitin. It …	binds with RNA polymerase ll of eukaryotes and inhibits transcription	binds with DNA template strand and blocks the movement of RNA polymerase	binds with the β-subunit of prokaryotic RNA polymerase and inhibits its activity	binds to promoter regions and blocks activation of transcription	inhibits termination of transcription
748	1	The same codons are used to code for the same amino acids in all the living organisms. This feature of genetic code is known as…	Universality	Specificity	Non-overlapping	Degenerate	-
749	1	A particular codon always codes for the same amino acid. This feature of genetic code is known as…	Specificity	Universality	Non-overlapping	Degenerate	-
750	1	The phenomenon in which a single mRNA can recognize more than one codon is referred as…	Wobble rule	Complementarity	Universality	Specificity	Non-overlapping
751	1	Translation is a complex process and it has become a favorite target for inhibition by antibiotics. Majority of the antibiotics interfere with the bacterial protein synthesis and are harmless to higher organisms. Explain the mechanism of action of streptomycin.	It causes misreading of mRNA and interferes with the normal pairing between codons and anticodons	It inhibits the binding of aminoacyl tRNA to the ribosomal complex	It enters the A site of ribosome and gets incorporated into the growing peptide chain and causes its release	It acts as a competitive inhibitor of the enzyme peptidyltransferase	It inhibits translocation by binding with 50S subunit of bacterial ribosome

752	1	Translation is a complex process and it has become a favorite target for inhibition by antibiotics. Majority of the antibiotics interfere with the bacterial protein synthesis and are harmless to higher organisms. Explain the mechanism of action of tetracycline.	It inhibits the binding of aminoacyl tRNA to the ribosomal complex	It causes misreading of mRNA and interferes with the normal pairing between codons and anticodons.	It enters the A site of ribosome and gets incorporated into the growing peptide chain and causes its release	It acts as a competitive inhibitor of the enzyme peptidyltransferase	It inhibits translocation by binding with 50S subunit of bacterial ribosome
753	1	Translation is a complex process and it has become a favorite target for inhibition by antibiotics. Majority of the antibiotics interfere with the bacterial protein synthesis and are harmless to higher organisms. Explain the mechanism of action of puromycin.	It enters the A site of ribosome and gets incorporated into the growing peptide chain and causes its release	It causes misreading of mRNA and interferes with the normal pairing between codons and anticodons.	It inhibits the binding of aminoacyl tRNA to the ribosomal complex	It acts as a competitive inhibitor of the enzyme peptidyltransferase	It inhibits translocation by binding with 50S subunit of bacterial ribosome
754	1	Translation is a complex process and it has become a favorite target for inhibition by antibiotics. Majority of the antibiotics interfere with the bacterial protein synthesis and are harmless to higher organisms. Explain the mechanism of action of chloramphenicol.	It acts as a competitive inhibitor of the enzyme peptidyltransferase	It inhibits translocation by binding with 50S subunit of bacterial ribosome	It enters the A site of ribosome and gets incorporated into the growing peptide chain and causes its release	It inhibits the binding of aminoacyl tRNA to the ribosomal complex	It causes misreading of mRNA and interferes with the normal pairing between codons and anticodons.

755	1	Translation is a complex process and it has become a favorite target for inhibition by antibiotics. Majority of the antibiotics interfere with the bacterial protein synthesis and are harmless to higher organisms. Explain the mechanism of action of erythromycin.	It inhibits translocation by binding with 50S subunit of bacterial ribosome	It acts as a competitive inhibitor of the enzyme peptidyltransferase	It enters the A site of ribosome and gets incorporated into the growing peptide chain and causes its release	It inhibits the binding of aminoacyl tRNA to the ribosomal complex	It causes misreading of mRNA and interferes with the normal pairing between codons and anticodons.
756	1	Arachidonic acid as essential nutrient is needed for normal growth and developement. It is precursor of biologically active substances. Indicate what compounds are synthesized from arachidonic acid	Prostaglandine E1	Noradrenalin	Ethanolamine	Triiodothyronine	Choline
757	1	The formation of a secondary mediator is obligatory in membrane-intracellular mechanism of hormone action. Point out the substance that is unable to be a secondary mediator:	Glycerol	Diacylglycerol	Inositol-3,4,5-triphosphate	cAMP	Ca2+
758	1	On some diseases it is observed aldosteronism with hypertension and edema due to sodium retention in the organism. What organ of the internal secretion is affected on aldosteronism?	Adrenal glands	Testicle	Ovaries	Pancreas	Hypophysis
759	1	A typical symptom of cholera is body water loss and sodium ions loss. The biochemical mechanism of unfavourable action of cholera toxin consists in:	Activation of adenylate cyclase activity of enterocytes	Activation of synthesis of atrial natriuretic factor	Decrease of synthesis of antidiuretic hormone in hypothalamus	Stimulation of rennin secretion by the cells of kidneys glomerular arteriolae	Activated oxidation of aldosterone in the cells of adrenal glands

760	1	A women with low arterial pressure after the parenteral introduction of a certain hormone showed the essential rise of arterial pressure as well as blood levels of glucose and lipids. What hormone was administered to the patient?	Adrenaline	Insulin	Glucagon	Progesterone	Estradiol
761	1	Biologically active substances, especially hormones, are products of hydrolysis and modification of certain proteins. From which of the listed below proteins do lipotropin, corticotropin, melanotropin and endorphins appear in hypophysis?	Proopiomelanocortin (POMC)	Neuroalbumins	Neurostromin	Neuroglobulin	Thyreoglobulin
762	1	Aspirin has antiinflammatory effect due to inhibition of the cyclooxygenase activity. Level of what biological active acids will decrease?	Prostaglandins	Leucotriens	Catecholamines	Biogenic amines	Iodinethyronyns
763	1	Increased production of thyroidal hormones T3 and T4, weight loss, tachycardia, psychic excitement and so on present on thyrotoxicosis. How do thyroidal hormones effect energy metabolism in the mitochondrion of cells?	Disconnect oxidation and oxidated phosphorylation	Activates phosphorylation of substance	Stops phosphorylation of substance	Stops respiratory chain	Activates oxidated phosphorylation
764	1	Products of some proteins hydrolysis and modification are the biologically active substances called hormones. Lipotropin, corticotropin, melanotropin and endorphins are synthesized in the hypophysis of the following protein:	Proopiomelanocortin (POMC)	Neuroalbumin	Neurostromin	Neuroglobulin	Thyreoglobulin
765	1	Utilization of arachidonic acid via cyclooxygenase pathway results in formation of some bioactive substances. Name them:	Prostaglandins	Thyroxine	Biogenic amines	Somatomedins	Insulin-like growth factors

766	1	A 45 y.o. woman suffers from Cushing's syndrome - steroid diabetes. Biochemical examination revealed: hyperglycemia, hypochloremia. Which of the under-mentioned processes is the first to be activated?	Gluconeogenesis	Glycogenolysis	Glucose reabsorption	Glucose transport to the cell	Glycolysis
767	1	The patient with complaints of permanent thirst applied to the doctor. Hyperglycemia, polyuria and increased concentration of 17-ketosteroids in the urine were revealed. What disease is the most likely?	Steroid diabetes	Insulin-dependent diabetes mellitus	Myxoedema	Type I glycogenosis	Addison's disease
768	1	Pregnant women have a requirement in the promoted amount of cholecalciferol; one of its metabolite is a powerful synergist of parathormone, which stimulates the process of bone resorbtion and output of calcium and phosphates in blood. Name this metabolite?	1,25-Dihydroxycholecalciferol	1-hydroxycholecalciferol	Cholecalciferol	Ergocalciferol	25-Hydroxycalciferol
769	1	A woman 47 years old complains for persistent feeling of thirst, rapid fatigue, loss of weight. Daily diuresis is 3-4 litters. Blood glucose level is 4.8 mmoles/l, in urine there is no glucose. In this case it is reasonable to investigate blood content of:	Vasopressin	Estrogens	Aldosterone	Cortisol	Thyroxine
770	1	A 40-year-old woman suffers from Cushing's disease, so-called steroid diabetes. Hyperglycemia and hypochlorinemia are biochemically exposed. Which of the following biochemical processes is activated in the first place?	Gluconeogenesis	Glycogenolysis	Reabsorption of glucose	Transport of glucose into cells	Glycolysis

771	1	A patient suffering from rheumatism was administered glucocorticoid therapy. What changes in carbohydrate metabolism in liver can be expected?	Stimulation of gluconeogenesis	Stimulation of glycogenesis	Stimulation of glycogen hydrolysis	Stimulation of glycogen phosphorolysis	Increase of glycogen phosphorylase activity
772	1	A 23-year-old patient complains of a headache, change of appearance (increase in feet and wrists size, face features distortion). His voice grew harsh, the memory worsened. The disease set in three years ago without apparent causes. The analysis of the urine is without special changes. A possible cause of this status can be:	Hyperproduction of somatotropin	Deficiency of glucagon	Deficiency of thyroxine	Deficiency of aldosterone	Hyperproducti on of corticosteroids
773	1	A 10-year-old boy was brought to a hospital for the inspection of the cause of growth retardation. He had grown only by three centimetres in the last two years. What hormone's deficiency is the cause of such state?	Somatotropin	Corticotropin	Gonadotropin	Thyrotropin	Parathormone
774	1	A 23-year-old patient complains of a headache, change of appearance (increase in feet and wrists size, face features distortion). His voice grew harsh, the memory worsened. The disease set in three years ago without apparent causes. The analysis of the urine is without special changes. A possible cause of this status can be:	Hyperproduction of somatotropin	Deficiency of glucagon	Deficiency of thyroxine	Deficiency of aldosterone	Hyperproducti on of corticosteroids

775	1	A patient complains of body weight loss, excessive irritability, insignificant increase of temperature, exophtalmia. Hyperglycemia and the rise of nitrogen-containing substances in blood serum were detected. Which is the most credible diagnosis in this case?	Diffuse toxic goiter	Neurosis	Bronzed disease	Tuberculosis of adrenal glands	Myxedema
776	1	Some compounds increase the permeability of internal membranes of mitochondria for H+, that results in disconnection of processes of respirations with phosphorylation and stopping of ATP synthesis. Name this compound:	Thyroxine	Vasopressin	Adrenalin	Insulin	Oxytocin
777	1	In blood of a patient a hypercalcemia, hypophosphatemia, in urine – hyperphosphaturia is observed. What is a possible cause of this state?	Enhanced secretion of parathyroid hormone	Suppression of parathyroid hormone synthesis	Enhanced secretion of calcitonin	Suppressed calcitonin secretion	Enhanced thyroxine secretion
778	1	In 13 years old girl a hypotension and polyuria is observed. Preliminary diagnosis – diabetes insipidus. It is caused by deficiency of:	Vasopressine	Aldosterone	Adrenalin	Cortisol	Oxytocin

779	1	Prostaglandins comprise a family of oxygenated lipid signaling molecules derived from polyunsaturated fatty acids such as arachidonic acid. They are involved in regulating a number of cellular processes. Some of the prostaglandins act to increase vasodilation and levels of cAMP in cells, whereas others increase vaso- and bronchoconstriction and smooth muscle contraction. In the conversion of arachidonic acid to prostaglandins, the oxygenation step is accomplished by the enzyme that synthesizes which of the following compounds?	Prostaglandin H2	Prostaglandin E2	Prostaglandin F2α	Prostaglandin D2	Prostaglandin I2
780	1	Signaling via prostanoids begins by interaction of the prostanoid with its receptor. The receptor involved is usually located in following compartment of the cell?	Plasma membrane of a cell near the cell making the prostanoid	Nucleus of a cell in a different organ from the cell making the prostanoid	Endoplasmic reticulum of the cell making the prostanoid	Lysosomes of a cell circulating in the blood	Golgi of a cell circulating in the blood
781	1	A patient, manifesting the memory decline after craniocerebral injury came to the neurologist. By alteration of what biochemical process is this complaint mediated?	Insufficient production of mediators	Insufficient synthesis of glutamine	The decreased synthesis of GABA	Insufficient ammonia detoxification	Lactate accumulation

782	1	A patient, suffering from epilepsy, presented seizures. The physician administered him an amino acid, performing important functions in brain, in particular participating in ammonia detoxification. It is also the source of the depressing mediator production. What amino acid did the physician administer to the patient?	Glutamate	Tyrosine	Methionine	Tryptophan	Arginine
783	1	Toxicity of ammonia is mediated by its ability to alter the tricarboxylic acids cycle in brain mitochondria. What amino acid does ammonia exclude from the tricarboxylic acids cycle?	Alpha-ketoglutarate	Succinate	Citrate	Malate	Isocitrate
784	1	Under the influence of physical factors there can develop defects in a DNA molecule. Ultraviolet irradiation, for instance, can cause development of dimers.Dimers are two adjacent pyrimidine bases joined together. Name these bases:	Thymine and cytosine	Adenine and thymine	Guanine and cytosine	Adenine and guanine	Guanine and thymine
785	1	Which peptide neurotransmitter, produced in hypophysis through the breakdown of highmolecular protein propiomelacortin, is bonded with opiate receptor?	Met-enkephaline	Oxitocin	ACTH	Neurotensin	Vasopresin
786	1	Which statement about opioid peptides is not true?	Activate the adenilate cyclase system in neurons	Are produced from the precursor proteins through the limited proteolysis	Are inactivated through the proteolytical breakdown	Interacting with opioid peptides exhibit analgesing and euphoric effects like morphin and its analogues	Include enkephalines, endorphines, neoendorphines and dinorphinse

787	1	In modern biochemical investigations for diagnostics of inherited diseases, detection of certain viruses (for example HIV), authentication of individual (gene dactylography in forensic medicine) so called "DNA-diagnostics" is employed. What method is used in these investigations?	Polymerase chain reaction	Chromatography	Electrophoresis	Rentgen-structural analysis	Electron microscopy
788	1	From nitrates, nitrites and nitrosamines in organism is formed nitrous acid which causes oxidative deamination of nitrogen bases of nucleotides. This induce a point mutation by replacement of cytosine to...	Uracil	Thymine	Adenine	Guanine	Inosine
789	1	5’-bromouracil inhibits the biosynthesis of one from the listed below compounds. Chose this compound	DNA	Protein	mRNA	rRNA	Histones
790	1	A physician prescribed allopurinol to a patient suffering from gout. What pharmacological property of allopurinol provides a therapeutic effect in this case?	Competitive inhibition of xanthine oxydase	Acceleration of pyrimidine nucleotides catabolism	Increace of nitrogen-containing substances excretion.	Decrease of pyrimidine nucleotides reutilization.	Acceleration of nucleic acids biosynthesis
791	1	In a child a physical and mental underdevelopment is observed. In urine is excreted large quantity of orotic acid. This hereditary disease is a result of the next metabolic disorder:	Pyrimidine nucleotides synthesis	Pyrimidine nucleotides breakdown	Purine nucleotides synthesis	Purine nucleotides breakdown	Ornithine cycle of urea production
792	1	In one month old child an enhanced content of orotic acid in urine is detected, a child has diminished weight gain. What treatment must be undertaken in order to correct metabolic disorders?	Injections of uridine	Injections of adenosine	Injections of guanosine	Injections of thymidine	Injections of histidine

793	1	The decrease of uric acid concentration and the accumulation of xanthine and hvpoxanthine were found in the blood of a 12-year-old boy. The genetic defect of the synthesis of what enzyme does it testifies to?	Xanthine oxydase	Arginase	Urease	Ornithine carbamoyl transferase	Glycerol kinase
794	1	RNA of AIDS virus invaded leukocyte and caused production of viral DNA in a cell with the aid of the enzyme revertase. This is based on the next process:	Reversed transcription	Operon activation	Operon repression	Convariant replication	Reversed translation
795	1	Into human body were incorporated mercury ions. This led to the increase in rate of transcription of the gene, responsible for detoxification of heavy metals. What protein gene amplification is in the background of this process?	Metallothioneine	Ceruloplasmin	Interferone	Transferrin	Ferritin
796	1	Oncology patient was administered an antitumor drug – methotrexate. After some period tumour cells lost sensitivity to this drug. What gene amplification caused this effect?	Dihydrofolate reductase	Glutathion reductase	Thioredoxine reductase	Ribonucleitide reductase	Methemoglobin reductase
797	1	For identification of father of a child is used the next analytical technique:	Polymerase chain reaction (PCR)	Northern blot analysis	Restriction fragmrnt length polymorphism analysis	DNA fingerprint analysis	Southern blot analysis
798	1	In oncology patients prolong application of antitumor drugs induce appearance of resistance of target cells to this drugs. What process is responsible for this effect?	Gene mutation	Gene recombination	Gene modification	Gene expression	Gene amplification
799	1	In a patient was recognized endemic goiter. What type of post-translational modification of thyroglobuline is damaged in a patient?	Iodination	Phosphorylation	Methylation	Acetylation	Glycosylation

800	1	A 50-year-old patient is diagnosed with gout and there is hyperuricemia in his blood. The metabolism of what substances is disturbed?	Purines	Fats	Amino acids	Carbohydrates	Pyrimidines
801	1	Parents of a 5-year-old child consulted a doctor. Examination of the child discovered retardation in mental development and growth, as well as a basement of the child's agility. The basal metabolism is lowered. What disease does the child suffer from?	Lesch-Nyhan syndrome	Cretinism	Phenylketonuria	Hyperparathyroidism	Endemic goiter
802	1	A 65-year-old man, suffering from gout, complains of pains in the area of kidneys. Ultrasonic inspection revealed the presence of stones inside the kidneys. Which biochemical process is the main cause of kidney stones formation?	Degradation of purine nucleotides	Catabolism of proteins	Ornithine cycle	Degradation of heme	Reduction of cysteine
803	1	In a man 45 years old, suffering from gout, increased concentration of uric acid in blood was observed. For treatment allopurinol was administered, which is a competitive inhibitor of the following enzyme:	Xanthine oxidase	Adenosine deaminase	Hypoxanthine phosphoribosyl transferase	Guanine deaminase	Adenin phosphoribosyl transferase
804	1	A 72 years old woman complains on pains in joints, restriction of movement in joints. The joints are swollen, looking as enlarged knots. In blood and urine an increased concentration of uric acid is detected. What disease is characterized by these symptoms?	Gout	Pellagra	Alkaptonuria	Thyrosinosis	Liver cirrhosis

805	1	If a double-stranded DNA molecule undergoes two rounds of replication in an in vitro system that contains all of the necessary enzymes and nucleoside triphosphates that have been labelled with 32P, which of the following best describes the distribution of radioactivity in the four resulting DNA molecules?	Two of the molecules contain radioactivity in both strands	Exactly one of the molecules contains radioactivity in only one strand	Exactly one of the molecules contains no radioactivity	Three of the molecules contain radioactivity in both strands	All four molecules contain radioactivity in only one strand
806	1	The 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
807	1	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
808	1	Urine analysis revealed a decrease in sodium ion concentration. Which hormone provides an enhanced reabsorption of sodium ions in the convoluted nephron tubules?	Aldosterone	Vasopressin	Somatostatin	Adrenaline	Acetylcholine
809	1	A 40-year-old patient has developed polyuria (10-12 liters per day) and polydipsia induced by damage to the hypothalamo-hypophyseal tract. What hormone deficiency causes such disorders?	Vasopressin	Oxytocin	Corticotropin	Somatotropin	Thyrotropin

810	1	When chyme enters the duodenum, it stimulates the secretion of gastrointestinal hormones. Which hormone is responsible for release of enzymes being included in digestive juices?	Cholecystokinin-pancreozymin	Secretin	Glucagon	Somatostatin	Calcitonin
811	1	Early pregnancy can be detected by using the appropriate test. A positive pregnancy test is based on the presence of the following hormone in urine:	Chorionic gonadotropin	Progesterone	Oestradiol	Prolactin	Oxytocin
812	1	Caffeine inhibits phosphodiesterase which converts cAMP to AMP. The most typical feature of caffeine intoxication is the reduced intensity of:	Glycogen synthesis	Protein phosphorylation	Pentose phosphate pathway	Glycolysis	Lipolysis
813	1	A 19-year-old young man has been examined in a nephrological hospital. Increased potassium content was detected in secondary urine of the patient.Such changes have been most likely caused by the increased secretion of the following hormone:	Aldosterone	Oxytocin	Adrenalin	Glucagon	Testosterone
814	1	In the course of evolution there developed molecular mechanisms for correction of damaged DNA molecules. This process is called:	Reparation	Transcription	Translation	Replication	Processing
815	1	In the course of evolution there developed molecular mechanisms for correction of damaged DNA molecules. This process is called:	Reparation	Transcription	Translation	Replication	Processing
816	1	A 12-year-old child is of short stature, has disproportionate body structure and mental retardation. These characteristics might be caused by the hyposecretion of the following hormone:	Thyroxine	Insulin	Cortisol	Somatotropin	Glucagon

817	1	As a result of treatment of viral RNA with nitrous acid, UCA triplet mutated to UGA triplet. What kind of mutation occurred?	Transition	Nucleotide deletion	Missense	Nucleotide insertion	Inversion
818	1	A patient has decreased concentration of magnesium ions that are required for ribosomes connection to granular endoplasmic reticulum. This condition is known to disrupt the process of protein biosynthesis. Disruption occurs at the following stage:	Translation	Transcription	Replication	Amino acids activation	Processing
819	1	Prior to glucose utilization in cells it is transported inside cells from extracellular space through plasmatic membrane. This process is stimulated by the following hormone:	Insulin	Glucagon	Thyroxin	Aldosterone	Adrenalin
820	1	A therapeutist has an appointment with a 40-year-old patient complaining of recurrent pain attacks in his hallux joints and their swelling. Urine analysis revealed its marked acidity and pink colour. What substances can cause such changes in the urine?	Uric acid salt	Chlorides	Ammonium salts	Calcium phosphate	Magnesium sulfate
821	1	During cell division DNA replication occurs after a signal is received from the cytoplasm, then a certain portion of the DNA helix unwinds and splits into two individual strains. What enzyme facilitates this process?	Helicase	RNA polymerase	Ligase	Restrictase	DNA polymerase

822	1	A 26-year-old woman at 40 weeks' gestation was admitted to the maternity ward. Examination revealed that the cervix was open, but uterine contractions were absent. The doctor gave her a hormonal drug to induce labor. Specify this drug:	Oxytocin	Hydrocortisone	Estrone	Testosterone	ACTH
823	1	In some areas of South Africa many people have sickle cell disease characterized by red blood cells that assume an abnormal sickle shape due to the substitution of glutamic acid for valine in the hemoglobin molecule. What is the cause of this disease?	Gene mutation	Disturbances of the mechanisms of genetic information transmission	Crossing-over	Genomic mutation	Transduction
824	1	A 43-year-old female complains of weight loss, hyperhidrosis, low-grade fever, increased irritability. She has been found to have hyperfunction of the sympatheticadrenal system and basal metabolism. These disorders can be caused by hypersecretion of the following hormone:	Thyroxine	Somatotropin	Corticotropin	Insulin	Aldosterone
825	1	Patients suffering from xeroderma pigmentosum have extremely photosensitive skin due to disrupted excision repair. Specify the process that is affected in such patients:	Repair of DNA molecule	Synthesis of iRNA	Maturation of iRNA	Synthesis of protein primary structure	Intron extraction and exon connection
826	1	Experimental studies revealed steroid hormones to have an effect on proteosynthesis. They influence synthesisof the following substances:	Specific messenger RNA	Adenosine triphosphate	Specific transferRNA	Guanosine triphosphate	Specific ribosomal RNA

827	1	For people adapted to high external temperatures profuse sweating is not accompanied by loss of large volumes of sodium chloride. This is caused by the effect the following hormone has on the perspiratory glands:	Aldosterone	Vasopressin	Cortisol	Tgyroxin	Natriuretic
828	1	A 40-year-old patient has developed polyuria (10-12 liters per day) and polydipsia induced by damage to the hypothalamo-hypophyseal tract. What hormone deficiency causes such disorders?	Vasopressin	Oxytocin	Corticotropin	Somatotropin	Thyrotropin
829	1	In a 52-year-old patient with chronic glomerulonephritis, the glomerular filtration rate (GFR) was reduced by 20% compared to normal. What causes the decrease in GFR in patients with chronic renal failure?	Reduced number of active nephrons	Tubulopathy	Obstruction of the urinary tract	Renal ischemia	Renal artery thrombosis
830	1	A 13 years old patient complains for general weakness, fatigue. Mental underdevelopementis observed. In course of investigation a high concentration of valine, isoleucine, leucine is detected in blood and in urine. Urine has specific odor. What may be the cause of that pathology?	Maple syrup disease	Basedov disease	Addison disease	Thyrosinosis	Histidinemia

831	1	A patient addressed to the physician with complaints for pain in small soints as well as in temporomandibular joints. Joints are enlarged, looking as thick nodes. In blood serum and in urine an increase of urates content is detected. Metabolism of what substances is impaired?	Purine bases	Amino acids	Glucose	Pyrimidines	Glycerol
832	1	In 15 years old boy, suffering from alkaptonuria, urine after standing changes to a black color. This disease is hereditary disorder of:	Tyrosine metabolism	Alanine metabolism	Urea synthesis	Uric acid biosynthesis	Cysteine metabolism
833	1	In urine of patient M. a high content of argininosuccinate is detected. What enzyme deficiency exists in a body?	Argininosuccinate lyase	Arginase	Argininosuccinate synthase	Carbamoyl phosphate synthetase	Tryptophan-5-monooxygenase
834	1	In a patient argininemia and argininuria is observed. Urea content in blood and in urine is decreased. What enzyme deficiency has a place?	Arginase	Glutamate dehydrogenase	Ornithine carbamoyl transferase	Argininosuccinate synthase	Tryptophan-5-monooxygenase
835	1	65 years old man, suffering from gout, complains for pain in kidney area. In course of ultrasound diagnostic renal stones were detected. Increased concentration of what substance is the most probable cause of stones formation in this case?	Uric acid	Bilirubin	Urea	Cystine	Cholesterol
836	1	Specify the mechanism of aldosterone action on the electrolytes metabolism:	Decreasing of the Na^+ excretion	Increasing of the Na^+ excretion	Increasing of the K^+ excretion	Decreasing of the K^+ excretion	Decreasing of the water excretion

837	1	The end product of purine metabolism, excreted with urine is:	Uric acid	Ammonium ion	Urea	Arginine	Creatinine
838	1	Concentration of calcium ion in urine of healthy adult is:	2,5-7,5 mmol	5,5-10,5 mmol	25-75 mmol	55-105 mmol	0,25-0,75 mmol
839	1	Excretion of sodium with urine is stimulated by the following hormone:	Atrium natriuretic peptide (ANP)	Vasopressin	Oxytocin	Aldosteron	Norepinephrin
840	1	Addison disease is caused by aldosterone insufficiency, leading to:	Retention of potassium in the body	Excessive loss of potassium from the body	Retention of Ca ions in blood	Retension of water and tissue swelling	Disorder in calcium metabolism
841	1	In kidney diseases a decrease of glomerular filtration is observed, which leads to decrease of elimination of final metabolic products from the body. What substances are mostly retained in the body?	Urea and creatinine	Uric acid and indicane	Amino acids	Ammonia and poliamines	Glucose and glucosamine
842	1	A part of food protein is not digested in intestinal tract and is decomposed by bacterial enzymes in large intestine. This is defined as putrifaction of protein. Detection of what substance in urine may serve as indicator of the intensity of putrifaction processes?	Indican	Protein	Urea	Creatinine and creatine	Urates

843	1	In 4 monthes child a “syndrome of blue clothes” is recognized, which is accompanied by periodical fever, enhanced exitability, growth retardation. Blood nitrogen is increased, in the urine an excess of animal indicane is detected. What amino acid absorption is impaired?	Tryptophan	Thyrosine	Phenylalanine	Lysine	Histidine
844	1	Examination of a patient revealed glycosuria and hyperglycemia. He complains of dry mouth, itchy skin, frequent urination, thirst. He has been diagnosed with diabetes mellitus. What is the cause of polyuria in this patient?	Increased urine osmotic pressure	Decreased plasma oncotic pressure	Increased filtration pressure	Decreased cardiac output	Increased plasma oncotic pressure
845	1	Steroid hormones, regulating mineral metabolism, are the next:	Aldosteron	Glucocorticoids	Progesteron	Cortisol	Norepinephrin
846	1	A patient with essential hypertension has been prescribed captopril. What is its mechanism of action?	Inhibition of angiotensin-converting enzyme activity	β-adrenoreceptor block	α-adrenoreceptor block	Angiotensin II receptor block	Peripheral vasodilatating effect
847	1	A 20-year-old patient complains of morbid thirst and huperdiuresis (up to 10 l daily). Glucose concentration in blood is normal but it is absent in urine. The patient hasbeen diagnosed with diabetes insipidus. What hormonal drug is the most appropriate for management of this disorder?	Vasopressin	Cortisol	Thyroxin	Oxytocin	Insulin

848	1	A month after a serious operation a 38-year-old patient has recovered and has now positive nitrogen balance. Urine of this patient may be found to have low concentration of the following nitrogen containing substance:	Urea	Lactate	Stercobilinogen	Galactose	17-ketosteroids
849	1	A patient's blood shows an increased concentration of pyruvate which is excreted with urine for the most part.This is typical for the following vitamin deficiency:	B_1	E	B_2	B_3	B_6
850	1	Analysis of a newborn's urine revealed phenylpyruvic acid. Its presence in urine is associated with the following pathology:	Phenylketonuria	Alkaptonuria	Albinism	Tyrosinosis	Gout
851	1	A patient has been delivered to a hospital with a provisional diagnosis of progressing muscle dystrophy. This diagnosiscan be confirmed by the increased concentration of the following substance found in urine:	Kreatine	Pyruvate	Carnosine	Troponin	Hydroxyprolin e
852	1	A man has a considerable decrease in diuresis as a result of 1,5 l blood loss. The primary cause of such diuresis disorder is the hypersecretion of the following hormone:	Vasopressin	Corticotropin	Natriuretic	Cortisol	Parathormone
853	1	A month after surgical constriction of rabbit's renal artery the considerable increase of systematic arterial pressure was observed. What of the following regulation mechanisms caused the animal's pressure change?	Angiotensin-II	Vasopressin	Adrenaline	Noradrenaline	Serotonin

854	1	A 23-year-old patient with diabetes has hyperglycemia at the rate of 19 mmol/l which is clinically manifested by glucosuria, polyuria, polydipsia. Which of the listed below mechanisms is responsible for the development of glycosuria?	Exceedence of glucose renal threshold	Non-enzymatic glycosylation of proteins	Polyuria	Polydipsia	Tissue dehydration
855	1	A 60-year-old man with a history of chronic intestinal obstruction has excessive protein putrefaction in the colon. What is the indicator of this process?	Indicanuria	Bilirubinuria	Hyperuricuria	Creatinuria	Glycosuria
856	1	After aperson had drunk 1,5 liters of water, the amount of urine increased significantly, and its relative density decreased to 1,001. These changes are a result of decreased water reabsorption in the distal nephron portion due to reduced secretion of:	Vasopressin	Aldosterone	Angiotensin II	Renin	Prostaglandins
857	1	A patient with pituitary tumor complains of increased daily diuresis (polyuria). Glucose concentration in blood plasma equals 4,8 mmol/l. What hormone can be the cause of this, if its secretion is disturbed?	Vasopressin	Aldosterone	Natriuretic hormone	Insulin	Angiotensin I
858	1	A 19-year-old young man has been examined in a nephrological hospital. Increased potassium content was detected in secondary urine of the patient. Such changes have been most likely caused by the increased secretion of the following hormone:	Aldosterone	Oxytocin	Adrenalin	Glucagon	Testosterone

859	1	Patients with erythropoietic porphyria (Gunther's disease) have teeth that fluoresce red on exposure to ultraviolet light; photosensitive skin; red urine. This disease is associated with the lack of the following enzyme:	Uroporphyrinogen -III cosynthase	Uroporphyrinogen-I synthase	Delta-aminolevulinate synthase	Uroporphyrinogen decarboxylase	Ferrochelatase
860	1	For several days a 55-year-old woman has been suffering from pain attacks in the right upper quadrant after eating fatty foods. Visually, there is yellowness of sclera and skin. The patient has a cholic stool, beer – colored urine. What substance present in the patient's urine causes its dark color?	Conjugated bilirubin	Ketone bodies	Unconjugated bilrubin	Stercobilin	Bilirubin glucuronides
861	1	Injection of an anaesthetic before the tooth extraction resulted in development of anaphylactic shock accompanied by oliguria. What pathogenetic mechanism caused the decrease in diuresis in this case?	Decrease in hydrostatic pressure in the renal corpuscle capillaries	Increase in hydrostatic pressure in the Bowman's capsule	Damage of the glomerular filter	Increase in oncotic pressure of blood plasma	Increase in vasopressin secretion
862	1	After the transfusion of the concentrated red blood cells the patient developed posttransfusion shock. What is the leading mechanism of the acute renal failure in this case?	Glomerular filtration disorder	Tubular reabsorption disorder	Tubular secretion disorder	Urinary excretion disorder	Impairment of the renal incretory function
863	1	Mother had noticed her 5-year-old child's urine to become dark in colour. Bile pigments in urine were not detected. The diagnosis of alkaptonuria was made. What pigment is deficient?	Homogentisic acid oxidase	Phenylalanine hydroxylase	Tyrosinase	Oxyphenylpyruvate oxidase	Phenylpyruvate decarboxylase

864	1	There is high content of proteine and erythrocytes in urine. This can be caused by increased:	Permeability of renal filter permeability	Effective filtration pressure	Hydrostatic blood pressure in glomerular capillaries	Hydrostatic pressure of primary urine in capsule	Oncotic pressure of blood plasma
865	1	Arterial pH is 7,4; primary urine 7,4; final urine - 5,8. Decrease in the pH of final urine is the result of the secretion of the following ions in the nephron tubules:	Hydrogen ions	Potassium ions	Hydrogen carbonate ions	Urea	Creatinine
866	1	A patient has oliguria caused by acute renal failure. What daily amount of urine corresponds with this symptom?	100-500 ml	1500-2000 ml	1000-1500 ml	500-1000 ml	50-100 ml
867	1	A patient at the early stage of diabetes mellitus was found to have polyuria. What is its cause?	Hyperglycemia	Ketonemia	Hypocholesterolemia	Hypercholesterolemia	Hyperkaliemia
868	1	A patient, who had been eating only polished rice, developed polyneuritis caused by thiamine deficiency. What compound can be indicative of this kind of avitaminosis when excreted with urine?	Pyruvic acid	Malate	Methylmalonic acid	Uric acid	Phenylpyruvate
869	1	A victim of a traffic accident is hospitalized at a resuscitation unit. Objectively: the patient is unconscious, BP is 90/60 mm Hg, high blood content of creatinine and urea is observed, diurnal diuresis is 80 ml. Characterize the patient’s diurnal diuresis:	Anuria	Oliguria	Polyuria	Pollakiuria	Nocturia
870	1	A patient has obstruction of the common bile duct. Which of these substances is usually found in urine in such cases?	Bilirubin	Ketone bodies	Uric acid	Creatinine	Glucose

871	1	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
872	1	Tetanic spasms of skeletal muscles occur under low calcium concentration in blood. What endocrine disorder can this condition be associated with?	Hypofunction of parathyroid gland	Hyperfunction of adrenal cortex	Hypofunction of adrenal cortex	Hyperthyroidism	Hypothyroidism
873	1	As a result of an emergency situation (shipwreck) a man had to drink sea (salty) water. What form of water-salt imbalance may occur in this case?	Hyperosmolar hyperhydration	Hypoosmolar hyperhydration	Hypotonic hyperhydration	Isoosmolar hyperhydration	Isotonic hyperhydration
874	1	A 40-year-old patient has developed polyuria (10-12 liters per day) and polydipsia induced by damage to the hypothalamo-hypophyseal tract. What hormone deficiency causes such disorders?	Vasopressin	Oxytocin	Corticotropin	Somatotropin	Thyrotropin
875	1	Stable contraction of myofibrilla of muscle fibers takes place due to accumulation of the following ions in the cytoplasm:	Calcium	Potassium	Sodium	Magnesium	Hydrogen
876	1	Drugs that block certain channels can prevent the transmission of excitation from presynaptic membrane to the postsynaptic memebrane of synapse. What channels are blocked?	Calcium	Sodium	Potassium potential-dependent	Potassium ATP-dependent	Chlorine

877	1	A 19-year-old young man has been examined in a nephrological hospital. Increased potassium content was detected in secondary urine of the patient. Such changes have been most likely caused by the increased secretion of the following hormone:	Aldosterone	Oxytocin	Adrenalin	Glucagon	Testosterone
878	1	A patient with pituitary tumor complains of increased daily diuresis (polyuria). Glucose concentration in blood plasma equals 4,8 mmol/l. What hormone can be the cause of this, if its secretion is disturbed?	Vasopressin	Aldosterone	Natriuretic hormone	Insulin	Angiotensin I
879	1	Wilson's disease is a disorder of copper transport which leads to the accumulation of this metal in brain and liver cells. It is associated with a disturbance in the synthesis of the following protein:	Ceruloplasmin	Metallothionein	Transcobalamin	Haptoglobin	Siderophilin
\880	1	Hormonal form of a certain vitamin induces genome level synthesis of Ca-binding proteins and enterocytes thus regulating the intestinal absorption of Ca2+ ions required for dental tissue development. What vitamin is it?	D3	K	A	E	B1
881	1	Following thyroid surgery, a 47-year old female patient had fibrillary twitching of muscles in the arms, legs and face. These disorders can be treated by the introduction of the following hormone:	Parathyroid hormone	Triiodothyronine	Thyrotropin	Thyroxine	Thyroid-stimulating hormone
882	1	Excretion of sodium with urine is stimulated by the following hormone:	Atrium natriuretic peptide (ANP)	Vasopressin	Oxytocin	Aldosteron	Norepinephrin

883	1	Addison disease is caused by aldosterone insufficiency, leading to:	Retention of potassium in the body	Excessive loss of potassium from the body	Retention of Ca ions in blood	Retension of water and tissue swelling	Disorder in calcium metabolism
884	1	The softening of bones in rickets is caused by deficiency of:	Cholecalciferol (D3)	Pantothenic acid	Nicotinamide	Parathyroid hormone	Pituitrine P
885	1	The cause of endemic goiter is deficiency of trace element:	Iodine	Iron	Zinc	Copper	Manganese
886	1	Selenium is an ultra trace element and is incorporated in structure of enzyme:	Glutathione peroxidase	Lactate dehydrogenase	Catalase	Myeloperoxidase	Pyruvate kinase
887	1	Trace element molybdenum is a cofactor of the enzyme:	Xantine oxidase	Tyrosinase	Trypthophane hydroxylase	Myeloperoxidase	Cytochrome c
888	1	Steroid hormones, regulating mineral metabolism, are the next:	Aldosteron	Glucocorticoids	Progesteron	Cortisol	Norepinephrin
889	1	Trace element cobalt is an element of the structure of vitamin:	Vitamin B12	Boitine	Vitamin B1	Vitamin B6	Pantothenic acid

890	1	Retention of water in blood plasma and prevention of tissue swelling depends on the oncotic pressure of plasma, which depends on the content of the next compounds:	Albumins	Lipids of lipoproteins	Immunoglobulins	Fibrinogen	Inorganic ions
891	1	The assmmetry of sodium and potassium ions distribution across plasma membrane of the cell is supported by the next membrane constituent:	K,Na-dependent ATP-ase	Sodium selective channel	Lecithine content of the membrane	Alkaline phosphatase	Cholesterol content
892	1	Specify the microelement which is the of T3 and T4:	Iodine	Fluorine	Bromine	Iron	Selenium
893	1	Specify the microelement with antioxidant function:	Selenium	Fluor	Brome	Iron	Iodine
894	1	Which electrolyte has the major role in the volume of the extracellular water homeostasis?	Sodium	Fluor	Brome	Iron	Iodine
895	1	Specify the mechanism of aldosterone action on the electrolytes metabolism:	Decreasing of the Na+ excretion	Increasing of the Na+ excretion	Increasing of the K+ excretion	Decreasing of the K+ excretion	Decreasing of the water excretion
896	1	Deposition of calcium in bones is controlled by the next hormone:	Calcitonin	Thyroid hormone triiodothyronin	Thyroid hormone	Calmodulin	Calcitriol
897	1	What disorders of water and mineral metabolism can be expected in a worker, having a job in hot conditions?	Hypoosmolar dehydration	Hyperosmolar dehydration	Cellular hyperhydration	Extracellular hyperhydration	Isotonic hyperhydration

898	1	A 35 y.o. patient who often consumes alcohol was treated with diuretics. There appeared serious muscle and heart weakness, vomiting, AP – 100/60 mm Hg, depression. This condition is caused by intensified excretion with urine of:	Potassium	Sodium	Chlorine	Calcium	Phosphates
899	1	A 15-year-old boy has been diagnosed with acute viral hepatitis. What blood value should be determined to confirm acute affection of hepatic cells?	Aminotransferaseactivity (AST, ALT)	Unconjugated and conjugated bilirubin content	Erythrocytes sedimentation rate (ESR)	Cholesterol content	Protein fraction content
890	1	Upon toxic damage of hepatic cells resulting in disruption of liver function the patient developed edemas. What changes of blood plasma are the main cause of edema development?	Decrease of albumin content	Increase of globulin content	Decrease of fibrinogen content	Increase of albumin content	Decrease of globulincontent
891	1	An infant born prematurely 2 days ago presents with yellow coloring of skin and mucosa. Such a condition in the infant is caused by temporary deficiency of the following enzyme:	UDP-glucuronyl transferase	Aminolevulinatesynthase	Heme oxygenase	Heme synthetase	Biliverdine reductase
892	1	A dry-cleaner's worker has been found to have hepatic steatosis. This pathology can be caused by disruption of synthesis of the following substance:	Phosphatidylcholine	Tristearin	Urea	Phosphatidic acid	Cholic acid
893	1	A 16-year-old adolescent is diagnosed with hereditary UDP (uridine diphosphate) glucuronyltransferase deficiency. Laboratory tests revealed hyperbilirubinemia caused mostly by increased blood content of the following substance:	Unconjugated bilirubin	Conjugated bilirubin	Urobilinogen	Stercobilinogen	Biliverdine

894	1	Cells of a healthy liver actively synthesize glycogen and proteins. What organelles are the most developed in them?	Granular and agranular endoplasmic reticulum	Cell center	Lysosomes	Mitochondria	Peroxisomes
895	1	A 43-year-old patient suffers from acute pancreatitis with disrupted common bile duct patency. What condition can develop in this case?	Mechanical jaundice	Hemolytic jaundice	Hepatocellular jaundice	Hepatic coma	Portal hypertension
896	1	Feces of a patient contain high amount of undissociated fats and have grayish-white color. Specify the cause of this phenomenon:	Obturation of bile duct	Hypoactivation of pepsin by hydrochloric acid	Hypovitaminosis	Enteritis	Irritation of intestinal epithelium
897	1	Steatosis is caused by the accumulation of triacylglycerols in hepatocytes. One of the mechanisms of this disease development is a decrease in the utilization of VLDL neutral fat. What lipotropics prevent the development of steatosis?	Methionine, B6, B12	Arginine, B2, B3	Alanine, B1, PP	Valine, B3, B2	Isoleucine, B1, B2
898	1	A patient has been admitted to the contagious isolation ward with signs of jaundice caused by hepatitis virus. Which of the symptoms given below is strictly specific for hepatocellular jaundice?	Increase of ALT, AST level	Hyperbilirubinemia	Bilirubinuria	Cholemia	Urobilinuria
899	1	A child has a history of hepatomegaly, hypoglycemia, seizures, especially on an empty stomach and in stressful situations. The child is diagnosed with Gierke disease. This disease is caused by the genetic defect of the following enzyme:	Glucose-6-phosphatase	Amyloid-1,6-glycosidase	Phosphoglucomutase	Glycogen phosphorylase	Glucokinase

900	1	A patient with jaundice has high total bilirubin that is mainly indirect (unconjugated), high concentration of stercobilin in the stool and urine. The level of direct (conjugated) bilirubin in the blood plasma is normal. What kind of jaundice can you think of?	Hemolytic	Parenchymal (hepatic)	Mechanical	Neonatal jaundice	Gilbert's disease
901	1	Enzymatic jaundices are accompanied by abnormal activity of UDP-glucuronyl transferase. What compound is accumulated in blood serum in case of these pathologies?	Unconjugated bilirubin	Conjugated bilrubin	Dehydrobilirubin	Hydrobilirubin	Choleglobin
902	1	Due to the blockage of the common bile duct (which was radiographically confirmed), the biliary flow to the duodenum was stopped. We should expect the impairment of:	Fat emulsification	Protein absorption	Carbohydrate hydrolysis	Secretion of hydrochloric acid	Salivation inhibition
903	1	Glucose content of blood keeps at sufficient level after one week of starvation. Is it caused by activation of the following process in the liver:	Gluconeogenesis	Glycolysis	Glycogenolysis	Tricarboxylic acid cycle	Glycogen phosphorolysis
904	1	For several days a 55-year-old woman has been suffering from pain attacks in the right upper quadrant after eating fatty foods. Visually, there is yellowness of sclera and skin. The patient has acholic stool, beer-colored urine. What substance present in the patient's urine causes its dark color	Conjugated bilirubin	Ketone bodies	Unconjugated bilrubin	Stercobilin	Bilirubin glucuronides

905	1	Roentgenologically confirmed an obstruction of common bile duct that prevents bile from inflowing to the duodenum. What process is likely to be disturbed?	Fat emulgation	Protein absorption	Carbohydrate hydrolysis	Hydrochloric acid secretion in stomach	Salivation inhibition
906	1	A 2-year-old child presents with mental development retardation, intolerance of proteins, severe hyperammonemia against the background of low blood urea content. This condition is caused by the congenital deficiency of the following liver enzyme:	Carbamoyl phosphate synthetase	Citrate synthase	Succinate dehydrogenase	Malate dehydrogenase	Monoamine oxidase
907	1	Corticosteroid analogues induce breakdown of muscle proteins into free amino acids. Under such conditions these amino acids become involved with the following processes:	Gluconeogenesis in liver	Glycolysis in muscles	Synthesis of higher fatty acids	Glycogenolysis	Decarboxylation
908	1	Biliverdin is transformed into bilirubin by the next chemical process:	Reduction with involvement of NADPH	Oxidation with biliverdine oxidase	Hydroxylation by monooxygenase	Oxidative deamination	Decarboxylation of propionic acid residues
909	1	Bilirubin UDP-glucuronyl transferase is absent from liver in:	Crigler-Najjar syndrome, type I	Gilbert's disease	Crigler-Najjar syndrome, type II	Rotor's syndrome	Dubin-Johnson syndrome
910	1	An experimantal animal that was kept on protein-free diet developed fatty liver infiltration, in particular as a result of deficiency of methylating agents. This is caused by disturbed generation of the following metabolite:	Choline	DOPA	Cholesterol	Acetoacetate	Linoleic acid

911	1	Fatty of phospholipids is disordered due to fat infiltration of the liver. Indicate which of the presented substances can enhance the process of methylation during phospholipids synthesis?	Methionine	Ascorbic acid	Glucose	Glycerin	Citrate
912	1	Free bilirubin (indirect bilirubin) is transformed in liver cells into conjugated (direct) bilirubin by conjugation with glucuronic acid with the aid of enzyme glucuronyl transferase. As substrate this enzyme uses the following compound:	UDP-glucuronate	Free glucuronate	CDP-glucose	CDP-glucuronate	UMP-glucuronate
913	1	In the normal resting state of human most of the blood glucose burnt as fuel is consumed by:	Liver	Brain	Adipose tissue	Muscles	Kidneys
914	1	What digestive process is altered in case of obstruction of bile duct and arrest of bile excretion to intestines?	Hydrolysis of triglycerides	Absorption of carbohydrates	Hydrolysis of proteins	Hydrolysis of complex sugars and polysaccharides	Absorption of amino acids
915	1	Prehepatic jaundice occurs because of:	Increased hemolysis	Liver damage	Biliary obstruction	None of these	Hepatitis
916	1	In dietary deficiency or insufficient production of endogeneous lipotropic factors in humans is developing fat degeneration of liver. What substances from listed below can be considered as lipotropic factor?	Choline	Fatty acids	Pyridoxine	Triacylglycerols	Cholesterol

917	1	Protoporphyrine cycle of heme is broken by the enzyme heme oxygenase with oxidation of one methene bridge, which is released as the next product:	Carbone monoxide	Formaldehyde	Carbone dioxide	Formic acid	Methane
918	1	Excretion of conjugated bilirubin from liver cells into biliary canaliculi is defective in:	Dubin-Johnson syndrome	Gilbert's disease	Crigler-Najjar syndrome	Lucey-Driscoll syndrome	Rotor's syndrome
919	1	To obese patient with risk of liver fat degeneration is recommended diet enriched with lipotropic factors. What nutritional component is the most important in diet?	Methionine	Cholesterol	Vitamin C	Glycine	Glucose
920	1	The greater amount of nitrogen is excreted from the organism in form of urea. Inhibition of urea synthesis and accumulation of ammonia in blood and tissues are induced by the decreased activity of the following liver enzyme:	Carbamoyl phosphate synthetase	Aspartate aminotransferase	Urease	Amylase	Pepsin
921	1	A child is languid, apathetic. Liver is enlarged and liver biopsy revealed a significant excess of glycogen. Glucose concentration in the blood stream is below normal. What is the cause of low glucose concentration?	Low (absent) activity of glycogene phosphorylase in liver	Low (absent) activity of hexokinase	High activity of glycogen synthetase	Low (absent) activity of glucose 6-phosphatase	Deficit of a gene that is responsible for synthesis of glucose 1-phosphaturidine transferase
922	1	In neonates after birth during 5-6 days develops jaundice. The cause of this disorder is insufficient activity of the following enzyme:	UDP-glucuronyl transferase	Porphobilinogen synthase	Aminolevulinate synthease	Heme oxygenase	Biliverdin reductase

923	1	In blood of a patient was found an increased content of total bilirubin, in urea were detected bilirubin diglucuronides, absence of stercobilin in feces (acholic stool). What vitamins deficiency can be developed in this special case?	D, K, A	B1, B2, B6	PP, C, U	Biothin and lipoic acid (vitamin N)	P, B15 (pangamic acid)
924	1	In a patient was recognized congenital liver disease, which is accompanied with high bilirubinemia due to increase in free (nonconjugated) bilirubin. In liver biopsia was detected trace activity of glucuronyl transferase. What disease can be recognized?	Crigler-Najjar syndrome	Gilbert syndrome	Physiological jaundice	Dubin-Johnson syndrome	Wilson disease
925	1	After a serious viral infection a 3-year-old child has repeated vomiting, loss of consciousness, convulsions. Examination revealed hyperammoniemia. What may have caused changes of biochemical blood indices of this child?	Disorder of ammonia neutralization in ornithinic cycle	Activated processes of aminoacids decarboxylation	Disorder of biogenic amines neutralization	Increased purtefaction of proteins in intestines	Inhibited activity of transamination enzymes
926	1	A patient suffering from rheumatism was administered glucocorticoids therapy. What changes in carbohydrate metabolism in liver can be expected?	Stimulation of gluconeogenesis	Stimulation of glycogenesis	Stimulation of glycogen hydrolysis	Stimulation of glycogen phosphorolysis	Increase of glycogen phosphorylase activity
927	1	A patient has yellow skin colour, dark urine, dark-yellow feces. What substance will have strengthened concentration in the blood serum?	Unconjugated bilirubin	Conjugated bilirubin	Mesobilirubin	Verdoglobin	Biliverdin
928	1	A 46 year old woman suffering from chololithiasis developed jaundice. Her urine became dark-yellow and feces became colourless. Blood serum will have the highest concentration of the following substance:	Conjugated bilirubin	Unconjugated bilirubin	Biliverdin	Mesobilirubin	Urobilinogen

929	1	In a patient with jaundice it was detected a block in transformation of bilirubin to bilirubin diglucuronide. The concentration of indirect bilirubin in blood was markedly increased. What pathology can be suggested in a patient?	Prehepatic jaundice	Hepatic jaundice	Posthepatic jaundice	Tumor of pancreas and occlusion of bile duct	Addison's disease
930	1	Investigation of patient indicated on inflammatory processes in gall bladder, alteration of colloidal stability and high risk of bile stones formation. What substance from listed below favors the formation of bile stones?	Cholesterol	Urates	Lecithine	Phosphates	Oxalates
931	1	In 14 years old patient a hereditary liver pathology was expected. It was detected high content of direct bilirubin in blood, deposition of melanin in liver due to alteration of bilirubin excretion to bile by liver cells. This state is characteristic to the next disease:	Dubin-Johnson syndrome	Crigler-Najjar syndrome	Gilbert disease	Physiological jaundice	Wilson disease
932	1	A man is resting after intensive physical effort. Which from different pathways of glucose metabolism is the most active in the liver at this time?	Gluconeogenesis from lactate	Glycolysis	Glycogenolysis	Breakdown of glycogen to glucose	Gluconeogenes is from amino acids
933	1	In a patient suffering from liver cirrhosis concentration of albumin in blood plasma is 15 g/l (normal value 32-55 g/l), prothrombine test – 40 seconds (normal value – 12-20 sec.). To what functional disorder in liver indicate these changes?	Inhibition of protein synthesis	Detoxification function	Excretory function	Production of bile	Secretion of lipoproteins to blood

934	1	It has been determined that one of a pesticide components is sodium arsenate that blocks lipoic acid. Enzyme activity can be impaired by this pesticide. Name this enzyme:	Pyruvate dehydrogenase complex	Microsomal oxidation	Methemoglobin reductase	Glutathione peroxidase	Glutathionereductase
935	1	A patient, who has been subsisting exclusively on polished rice, has developed polyneuritis due to thiamine deficiency. What substance is an indicator of such avitaminosis, when it is excreted with urine?	Pyruvic acid	Malate	Methylmalonic acid	Uric acid	Phenyl pyruvate
936	1	After an extended treatment with sulfanamides a patient has developed macrocytic anemia. Production of active forms of the following vitamin is disrupted in such a condition:	Folic acid	Thiamine	Riboflavin	Pyridoxine	Cyanocobalamin
937	1	A patient presents with dry peeling skin, frequent cases of acute respiratory diseases, xerophthalmia. What vitamin preparation should be prescribed in this case?	Retinol acetate	Thiamine	Cyanocobalamin	Menadione (Vikasolum)	Ergocalciferol
938	1	A 6-year-old child suffers from delayed growth, disrupted ossification processes, decalcification of the teeth. What can be the cause?	Vitamin D deficiency	Decreased glucagon production	Insulin deficiency	Hyperthyroidism	Vitamin C deficiency
939	1	Coenzym A participates in numerous important metabolic reactions. It is a derivative of the following vitamin:	Pantothenic acid	Thiamine	Niacin	Calciferol	Ubiquinone
940	1	During regular check-up a child is detected with interrupted mineralization of the bones. What vitamin deficiency can be the cause?	Calciferol	Riboflavin	Tocopherol	Folic acid	Cobalamin

941	1	A 4-year-old child with hereditary renal lesion has signs of rickets; vitamin D concentration in blood is normal. What is the most probable cause of rickets development?	Impaired synthesis of calcitriol	Increased excretion of calcium	Hyperfunction of parathyroid glands	Hypofunction of parathyroid glands	Lack of calcium in food
942	1	One of the factors that cause obesity is inhibition of fatty acids oxidation due to:	Low level of carnitine	Impaired phospholipid synthesis	Excessive consumption of fatty foods	Choline deficiency	Lack of carbohydrates in the diet
943	1	A patient, who has been suffering for a long time from intestine disbacteriosis, has increased hemorrhaging caused by disruption of posttranslational modification of blood-coagulation factors II, VII, IX, and X in the liver. What vitamin deficiency is the cause of this condition?	K	B12	B9	C	P
944	1	A patient is diagnosed with chronic atrophic gastritis attended by deficiency of Castle's intrinsic factor. What type of anemia does the patient have?	B12-deficiency anemia	Iron refractory anemia	Hemolytic anemia	Iron-deficiency anemia	Protein-deficiency anemia
945	1	Malaria is treated with structural analogs of vitamin B2 (riboflavin). These drugs disrupt the synthesis of the following enzymes in plasmodium:	FAD-dependent dehydrogenase	Cytochrome oxidase	Peptidase	NAD-dependent dehydrogenase	Aminotransferase
946	1	Degenerative changes in posterior and lateral columns of spinal cord (funicular myelosis) caused by methylmalonic acid accumulation occur in patients with B12-deficiency anemia. This results in synthesis disruption of the following substance:	Myelin	Acetylcholine	Norepinephrine	Dopamine	Serotonin

947	1	Symptoms of pellagra (vitamin PP deficiency) is particularly pronounced in patients with low protein diet, because nicotinamide precursor in humans is one of the essential amino acids, namely:	Tryptophan	Threonine	Arginine	Histidine	Lysine
948	1	Steatosis is caused by the accumulation of triacylglycerols in hepatocytes. One of the mechanisms of this disease development is a decrease in the utilization of VLDL neutral fat. What lipotropics prevent the development of steatosis?	Methionine, B6, B12	Arginine, B2, B3	Alanine, B1, PP	Valine, B3, B2	Isoleucine, B1, B2
949	1	A 36-year-old female patient has a history of B2-hypovitaminosis. The most likely cause of specific symptoms (epithelial, mucosal, cutaneous, corneal lesions) is the deficiency of:	Flavin coenzymes	Cytochrome A1	Cytochrome oxidase	Cytochrome B	Cytochrome C
950	1	A patient complains of photoreception disorder and frequent acute viral diseases. He has been prescribed a vitamin that affects photoreception processes by producing rhodopsin, the photosensitive pigment. What vitamin is it?	Retinol acetate	Tocopherol acetate	Pyridoxine hydrochloride	Cyanocobalamin	Thiamine
951	1	A patient diagnosed with focal tuberculosis of the upper lobe of the right lung had been taking isoniazid as a part of combination therapy. After some time, the patient reported of muscle weakness, decreased skin sensitivity, blurred vision, impaired motor coordination. Which vitamin preparation should be used to address these phenomena?	Vitamin B6	Vitamin A	Vitamin D	Vitamin B12	Vitamin C

952	1	Some infectious diseases caused by bacteria are treated with sulfanilamides which block the synthesis of bacteria growth factor. What is the mechanism of their action?	They are antivitamins of para-amino benzoic acid	They inhibit the absorption of folic acid	They are allosteric enzyme inhibitors	They are involved in redox processes	They are allosteric enzymes
953	1	A number of diseases can be diagnosed by evaluating activity of blood transaminases. What vitamin is one of cofactors of these enzymes?	B6	B1	B2	B8	B5
954	1	A 20-year-old male patient complains of general weakness, rapid fatigability, irritability, decreased performance, bleeding gums, petechiae on the skin. What vitamin deficiency may be a cause of these changes?	Ascorbic acid	Riboflavin	Thiamine	Retinol	Folic acid
955	1	Examination of a child who hasn't got fresh fruit and vegetables during winter revealed numerous subcutaneous hemorrhages, gingivitis, cariouscavities in teeth. What vitamin combination should be prescribed in this case?	Ascorbic acid and rutin	Thiamine and pyridoxine	Folic acid and cobalamin	Riboflavin and nicotinamide	Calciferol and ascorbic acid
956	1	Vitamin A together with specific cytoreceptors penetrates through the nuclear membranes, induces transcription processes that stimulate growth and differentiation of cells. This biological function is realized by the following form of vitamin A:	Trans-retinoic acid	Trans-retinal	Cis-retinal	Retinol	Carotin

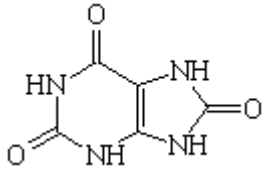
957	1	To prevent postoperative bleeding a 6year-old child was administered vicasol that is a synthetic analogue of vitamin K. Name post-translational changes of blood coagulation factors that will be activated by vicasol:	Carboxylation of glutamin acid	Phosphorylation of serine radicals	Partial proteolysis	Polymerization	Glycosylation
958	1	A 64 yearold woman has impairment of twilight vision (hemeralopy). What vitamin should be recommended in the first place?	A	B2	C	E	B6
959	1	A 10-year-old girl has a history of repeated acute respiratory viral infection. After recovering she presents with multiple petechial hemorrhages on the sites of friction from clothing rubbing the skin. What kind of hypovitaminosis has this girl?	C	B6	B1	A	B2
960	1	A patient has pellagra. Interrogation revealed that he had lived mostly on maize for a long time and eaten little meat. This disease had been caused by the deficit of the following substance in the maize:	Tryptophan	Tyrosine	Proline	Alanine	Histidine
961	1	A doctor recommends a patient with duodenal ulcer to drink cabbage and potato juice after the therapy course. Which substances contained in these vegetables help to heal and prevent the ulcers?	Vitamin U	Pantothenic acid	Vitamin C	Vitamin B1	Vitamin K
962	1	A 36-year-old female patient has a history of collagen disease.Urine analysis is likely to reveal an increased concentration of the following metabolite:	Oxyproline	Indican	Creatinine	Urea	Urobilinogen

963	1	A patient has an increased pyruvate concentration in blood, most of it is excreted with the urine. What kind of avitaminosis has this patient?	B1	B2	E	B3	B6
964	1	Vitamin B1 deficiency causes disturbance of oxidative decarboxylation of α-ketoglutaric acid. This leads to the impaired synthesis of the following coenzyme:	Thiamine pyrophosphate	Nicotinamide adenine dinucleotide	Flavine adenine dinucleotide	Lipoic acid	Coenzyme A
965	1	A 1-year-old baby has been hospitalised for body and limbs lesions. Examination revealed carnitine deficiency in the child's muscles. A biochemical reason for this pathology is the disorder of:	Transport of fatty acids to mitochondria	Regulation of Ca2+ rate in mitochondria	Substrate-linked phosphorylation	Utilization of lactic acid	Oxidative phosphorylation
966	1	Biotin as a cofactor participates in the next metabolic reactions:	Incorporation of CO2 into molecules of metabolites (carboxylation)	Decarboxylation of pyruvate	Oxidation of fatty acids	Transfer of phosphate groups (kinase reaction)	Production of H2O2 (oxidase reaction)
967	1	In an ill child the enlargement of abdomen, curvature of lower limbs, skul enlargement, general weakness is observed. What nutrient insufficiency can lead to developement of such manifestations?	Vitamin D	Vitamin C	Carbohydrates	Lipids	Iron
968	1	A patient complains for a loss of weight, general weakness, bleeding of gums, loosening and hasitation and fall out of teeth. What vitamin deficiency is observed in a patient?	Ascorbic acid	Pyridoxine	Cyanocobalamine	Phylloquinone	Tocoferol

969	1	A patient is complaining of gums bleeding. What vitamins are to be prescribed for the treatment of this patient?	C, K	Biotin, panthothenic acid	A, E	PP, B12	B1,B2
970	1	The content of vitamin PP is very low in milk and eggs, never the less these products have antipellagric action. It is caused by high content of precursor of this vitamin in mentioned products, namely:	Tryptophan	Adenine	GDP	Riboflavin	Thiamine
971	1	According to the clinical signs, pyridoxal phosphate was prescribed to a patient. For the correction of what biochemical processes is this drug recommended?	Transamination and decarboxylation of amino acids	Synthesis of purines and pyrimidines	Collagen synthesis	Deamination of amino acids	Protein synthesis
972	1	Persons suffering from alcoholism get the bulk of calories with alcohol drinks. They usually have typical deficiency of thiamine (Wernicke-Korsakov syndrome) that impairs the function of the nervous system, leads to psychoses, loss of memory etc. The decreased activity of what enzyme is the cause of the development of this syndrome?	Pyruvate dehydrogenase	Aldose	Transaminase	Hexokinase	Alcohol dehydrogenase
973	1	Select the metabolic process with which thiamine is mostly associated:	Decarboxylation of α-ketoacids	Biosynthesis of collagen	Biosynthesis of amino acids	Oxidation of fatty acids	Biosynthesis of prothrombin
974	1	The twilight sight of a patient who suffers from dryness of his conjunctiva and cornea has decreased. Such disorder can be caused by the deficiency of:	Vitamin A	Vitamin C	Vitamin D	Vitamin B5	Vitamin B12

975	1	Biochemical functions of water soluble vitamins are realized due to their transformation to coenzymes. What coenzyme is formed by vitamin PP?	NAD (nicotinamide adenine dinucleotide)	FAD (flavin adenine dinucleotide)	Pyridoxalphosphate	FMN (flavinmononucleotide)	Thiamine pyrophosphate
976	1	Which of the following symptoms would be seen in a patient with a severe deficiency of thiamine?	A decreased level of transketolase activity in red blood cells	An increased clotting time of blood	A low level of cell transaminase activity	Xerophthalmia	A decrease in blood level of pyruvate and lactate
977	1	The treatment of a child, who suffers from rickets, with vitamin D3 proved to be unsuccessful. Which is the most likely cause of treatment inefficiency?	Disturbance of hydroxylation of vitamin D3	Insufficiency of lipids in food	Disturbance of insertion of vitamin D3 into the molecule of enzyme	Increased consumption of vitamin D3 by microorganisms of intestines	Disturbance of vitamin D3 transport by the proteins of blood
978	1	Thiamine pyrophosphate is a cofactor of which of the following enzymes?	Pyruvate dehydrogenase complex	Aminotransferase	Citrate synthase	Arginase	Succinate dehydrogenase
979	1	Pantothenic acid is a precursor of the next coenzyme:	Coenzyme A	Coenzyme Q	SAM (S-adenosylmethionine)	NADP	FAD
980	1	The precursor of cholecalciferol in human is the following substance:	7-dehydrocholesterol	Phylloquinone	Ergosterol	Heme, released after degradation of hemoglobin	Carotene

981	1	Under different pathological states the level of active forms of oxygen rises, which results in the destruction of cellular membranes. In order to prevent the damage of membranes, antioxidants are used. The most powerful natural antioxidant is:	α-Tocoferol	Vitamin A	Glucose	Fatty acids	Glycerol
982	1	Vitamin K is a cofactor of carboxylase, which produce the next amino acid derivative:	γ-Carboxyglutamate	ε-Hydroxylysine	γ-Carboxyaspartic acid	N-Carboxyhistidine	Carboxyproline
983	1	Deficiency of ergocalciferol causes development of the next disease:	Rickets	Pernicious anemia	Pellagra	Scurvy	Xerophthalmia
984	1	After several months in polar expedition in a person appeared the next symptoms: bleeding of gums, multiple tooth decay (caries), loss of hair, skin hemorrhages, headache and general weakness. What disease can be suggested?	Scurvy	Polyneuritis	Beri-beri	Pernicious anemia	Pellagra
985	1	In a patient with symptoms of acidosis (pH lowering in blood) in urine was detected significant quantity of methylmalonic acid. This is caused by insuficiency of the next vitamin:	B12	B2	B5	C	D
986	1	A patient complains for loss of apetite, fall down of hair, general body exhaustion, conjunctivitis. From an anamnesis it was recognized, that patient consumed fish oil. Excess of what vitamin can be suspected in this case?	Vitamin A	Vitamin D	Vitamin C	Vitamin E	Vitamin H

987	1	A patient was diagnosed with dermatitis as a result of prolonged consumption of raw eggs. What vitamin deficiency developed in this case?	Biotin	Folic acid	Pantothenic acid	Para-amino benzoic acid	Vitamin C
988	1	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 P-450	Cytochrome C	Cytochrome A_3	Cytochrome A	Cytochrome C_1
989	1	Uric acid is a derivative of: 	Purine	Indole	Pyrazine	Pyrazole	Pyridine
990	1	An oculist detected increased time of darkness adaptation of a patient's eye. What vitamin deficiency can cause such symptom?	A	E	C	K	D
991	1	What enzyme allows for synthesys of various genes from template-RNA to DNA in genetic engineering (this enzyme catalyzes the process detected in RNAviruses)?	Reverse transcriptase	Exonuclease	DNA-ligase	Helicase	Endonuclease
992	1	Chromatin contains positively charged histone proteins. What amino acid is contained in histone proteins in large amounts?	Lysine	Alanine	Valine	Threonine	Serine
993	1	Diet of a human must contain vitamins. What vitamin is usually prescribed for treatment and prevention of pellagra?	Vitamin PP	Vitamin C	Vitamin A	Vitamin B1	Vitamin D

994	1	A patient has obstruction of the common bile duct. Which of these substances is usually found in urine in such cases?	Bilirubin	Ketone bodies	Uric acid	Creatinine	Glucose
995	1	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
996	1	The 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
997	1	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
998	1	Trypsin and related to it proteolytic enzymes (chymotrypsin, thrombin et al.) contain in active center a specific amino acid residue, which is covalently modified by fluorophosphate compounds with irreversible lost of enzymatic activity. What is this amino acid residue?	Serine	Tyrosine	Threonine	Aspartate	Methionine
998	1	Acetylcholin esterase cleaves acetylcholin hydrolytically. Insecticides, pesticides and nerve gases of fluorophosphates structure irreversibly inhibit acetylcholin esterase. What type of inhibition is it?	Inhibitors bind with serine residue in active center	Inhibitors are structural analogs of true substrate	Inhibitors bind with histidine residue in allosteric center	Inhibitors form complex with acetylcholine	Inhibitors induce denaturation of enzyme

999	1	Cataract (lenticular opacity) has developed in a 52-year-old woman with pancreatic diabetes. What process has intensified and thus caused lenticular opacity?	Protein glycosylation	Lipolysis	Ketogenesis	Protein proteolysis	Gluconeogenesis
1000		46-year-old patient was found to have hyperactivity of creatine kinase in his blood serum. What kind of pathology can be suspected?	Myocardial infarction	Acute pancreatitis	Chronic hepatitis	Haemolytic anemia	Renal failure
1001	1	A 35-year-old man with peptic ulcer disease has undergone antrectomy (removal of part of stomach). After the surgery secretion of the following gastrointestinal hormone will be disrupted the most:	Gastrin	Histamine	Secretin	Cholecystokinin	Neurotensin
1002	1	When investigating human saliva it is necessary to assess its hydrolytic properties. What substance should be used as a substrate in the process?	Starch	Proteins	Fats	Fiber	Amino acids
1003	1	Name the drug that inhibits excretory function of pancreas during treatment of acute pancreatitis:	Contrykal (Aprotinin)	Allochol	Panzynorm	Pancreatin (Mezym forte)	Festal
1004	1	Feces of a patient contain high amount of undissociated fats and have grayish-white color. Specify the cause of this phenomenon:	Obturation of bile duct	Hypoactivation of pepsin by hydrochloric acid	Hypovitaminosis	Enteritis	Irritation of intestinal epithelium
1005	1	A patient has a critical impairment ofprotein,fat and hydrocarbon digestion. Most likely it has been caused by low secretion of the following digestive juice:	Pancreatic juice	Saliva	Gastric juice	Bile	Intestinal juice

1006	1	A 40-year-old female patient diagnosed with acute pancreatitis has been delivered to the admission department of a regional hospital. What drug should be administered the patient in the first place?	Contrycal	Platyphyllin	Atropine	Metacin	Pirenzepine
1007	1	A patient has normally coloured stool including a large amount of free fatty acids. The reason for this is a disturbance of the following process:	Fat absorption	Fat hydrolysis	Biliary excretion	Choleresis	Lipase secretion
1008	1	To prevent attacks of acute pancreatitis a doctor prescribed the patient trasylol (contrycal, gordox), which is an inhibitor of:	Trypsin	Elastase	Carboxypeptidase	Chymotrypsin	Gastricsin
1009	1	A hospital has admitetd a patient complaining of abdominal bloating, diarrhea, flatulence after eating protein foods. These signs are indicative of the impaired digestion of proteins and their increased degradation. Which of the following compounds is the product of this process?	Indole	Bilirubin	Cadaverine	Agmatine	Putrescine
1010	1	Due to the blockage of the common bile duct (which was radiographically confirmed), the biliary flow to the duodenum was stopped. We should expect the impairment of:	Fat emulsification	Protein absorption	Carbohydrate hydrolysis	Secretion of hydrochloric acid	Salivation inhibition
1011	1	A 30 year old woman has subnormal concentration of enzymes in the pancreatic juice. This might be caused by the hyposecretion of the following gastrointestinal hormone:	Cholecystokinin-pancreozymin	Somatostatin	Secretin	Gastro-inhibiting peptide	Vaso-intestinal peptide

1012	1	A 60 year old patient was found to have a dysfunction of main digestive enzyme of saliva. This causes the disturbance of primary hydrolysis of:	Carbohydrates	Fats	Proteins	Cellulose	Lactose
1013	1	A 30-year-old male patient with acute pancreatitis has been found to have a disorder of cavitary protein digestion. The reason for such condition can be the hyposynthesis and hyposecretion of the following enzyme:	Tripsin	Pepsin	Lipase	Dipeptidase	Amylase
1014	1	A coprological survey revealed light colored feces containing drops of neutral fat. The most likely reason for this condition is the disorder of:	Bile inflow into the bowel	Gastric juice acidity	Pancreatic juice secretion	Intestinal juice secretion	Intestinal absorption
1015	1	A newborn develops dyspepsia after the milk feeding. When the milk is substituted by the glucose solution the dyspepsia symptoms disappear. The newborn has the subnormal activity of the following enzyme:	Lactase	Invertase	Maltase	Amylase	Isomaltase
1016	1	A patient complains of frequent diarrheas, especially after consumption of rich food, weight loss. Laboratory examination revealed steatorrhea; his feces were hypocholic. What might have caused such condition?	Obturation of biliary tracts	Inflammation of mucous membrane of small intestine	Lack of pancreatic lipase	Lack of pancreatic phospholipase	Unbalanced diet
1017	1	A newborn child suffers from milk curdling in stomach, this means that soluble milk proteins (caseins) transform to insoluble proteins (paracaseins) by means of calcium ions and a certain enzyme. What enzyme takes part in this process?	Renin	Pepsin	Gastrin	Secretin	Lipase

1018	1	A patient consumed a lot of reach in proteins food that caused increase of rate of proteolytic enzymes of pancreatic juice. It is also accompanied by increase of rate of the following enzyme:	Tripsin	Pepsin	Enterokinase	Gastricsin	Renin
1019	1	A patient with gastric juice hypersecretion has been recommended to exclude from the diet rich broths and vegetable infused water. A doctor recommended it, because these food products stimulate production of the following hormone:	Gastrin	Secretin	Cholecystokinin	Somatostatin	Neurotensin
1020	1	A 40-year-old patient suffers from intolerance of dairy food products. This condition has likely developed due to insufficiency of the following digestive enzyme:	Lactase	Lipase	Maltase	Invertase	Amylase
1021	1	Roentgenologically confirmed an obstruction of common bile duct that prevents bile from inflowing to the duodenum. What process is likely to be disturbed?	Fat emulgation	Protein absorption	Carbohydrate hydrolysis	Hydrochloric acid secretion in stomach	Salivation inhibition
1022	1	After drinking milk a 1-year-old child has developed diarrhea and flatulence. The baby is likely to have the deficiency of the following enzyme:	Lactase	Maltase	Aldolase	Hexokinase	Glycosidase
1023	1	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

1024	1	Patient has an insufficiency of enzyme-producing function of stomach. Detection of activity of what enzyme would not be informative for the diagnosis of this disease in adults?	Rennin	Pepsin A	Uropepsin	Pepsin B	Gastricsin
1025	1	Patient with chronic inflammation of pancreas was prescribed an inhibitor of proteolytic enzymes which are produced in pancreas in nonactive state as zymogens. What mechanism is the basis of activation of trypsin ?	Partial proteolysis of zymogen molecule	Dephosphorylation	Proteolysis of C-end of hexapeptide	Phosphorylation	Allosteric regulation
1026	1	New-born child suffers from milk coagulation in stomach, which means that soluble proteins of milk caseins are transformed into insoluble - paracaseins with the involvement of calcium ions and certain enzyme. What enzyme takes part in this process	Renin	Lipase	Gastrin	Pepsin	Secretin
1027	1	Laboratory investigation of the patient's blood plasma, which was performed 4 hours after a consumption of a fat diet, displayed a marked increase of plasma turbidity. The most credible cause of this phenomenon is the increase of ……..... in the plasma.	Chylomicrons	LDL	HDL	Cholesterol	Phospholipids
1028	1	The insufficient secretion of what enzyme is the cause of incomplete fats degradation in the digestive tract and appearance of great quantity of neutral fats in feces?	Pancreatic lipase	Phospholipase	Pepsin	Amylase	Enterokinase

1029	1	Surgical removal of a part of stomach resulted in disturbed absorption of vitamin B12, it is excreted with feces. The patient was diagnosed with anemia. What factor is necessary for absorption of this vitamin?	Gastromucoprotein	Gastrin	Hydrochloric acid	Pepsin	Folic acid
1030	1	Note substance, which activates pepsinogen to pepsin:	Hydrochloric acid	Enterokinase	Trypsin	Bile acids	Adenosine triphosphate
1031	1	Chose the enzyme which plays an important role in production of hydrochloric acid by parietal cells of gastric mucosa glands:	Carbonic anhydrase	Catalase	Pyruvate dehydrogenase	Cytochrome oxidase	Peroxidase
1032	1	Which of the following is not a function of the pancreas?	Secretes alkaline juice which neutralized chyme while chyme is stored in the stomach	Secretes insulin as well as glucagon into pancreatic duct	Secretes both endocrine and execrine substances	Secretes amylase which acts on starches to convert them to maltose	Secretes lipase which acts on bile-emulsified fats to convert them to fatty acids and glycerol
1033	1	Zymogens of proteolytic enzymes are activated by the next process:	Limited proteolysis	Hydroxylation of lysine	Carboxylation of glutamic acid	Decarboxylation of aspartic acid side chain	Phosphorylation of serine residues in protein molecule
1034	1	A decrease in production and secretion of trypsin is observed in an inflammatory changes in pancreatic gland. Digestion and absorption of what substances will be impaired in this situation?	Proteins	Lipids	Disaccharides	Nucleic acid	Polysaccharides

1035	1	The bile salts are:	Detergents for breaking up large fat globules to small ones	Reabsorbed primarily by the gallbladder	The major ingredients of gallstones	Enzymes for digesting food in the small intestines	Stimulants to pancreatic secretion of enzymes
1036	1	An individual who consumes 100 g of protein loses 13,5 g of nitrogen in the urine, 2 g in the feces, and 0,5 g by other routes. This individual most evidently is:	A normal, healthy adult	74-old woman	33-old men after trauma	Consuming a diet deficient in lysine	6-year-old child
1037	1	What substance is produced from tryptophan in case of protein putrefaction in digestive tube?	Indole	Putrescine	Cresol	Phenol	Serotonine
1038	1	The level of protein putrefaction in bowels can be evaluated by determination of the next compound in urine:	Indicane	Scatole	Indole	Indoxyle	Scatoxyle
1039	1	Lipids of food stuffs in digestive tract are cleaved and absorbed in intestines. What products of lipid hydrolysis are absorbed in intestines?	Fatty acids	Amino acids	Lipoproteins	Monosaccharides	Polypeptides
1040	1	In duodenum the digestion of carbohydrates occurs due to action of pancreatic enzymes. What enzymes from listed below can hydrolase α1-4 glycosidic bonds?	α-amylase	Lipase	Carbixypeptidase	Trypsin	Elastase
1041	1	A patient is diagnosed with chronic atrophic gastritis attended by deficiency of Castle's intrinsic factor. What type of anemia does the patient have?	B12-deficiency anemia	Iron refractory anemia	Hemolytic anemia	Iron-deficiency anemia	Protein-deficiency anemia

1042	1	In dietary deficiency or insufficient production of endogeneous lipotropic factors in humans is developing fat liver degeneration. What substances from listed below can be considered as lipotropic factor?	Choline	Pyridoxine	Triacylglycerols	Cholesterol	Fatty Acids
1043	1	Selenium is an ultra trace element and is incorporated in structure of enzyme:	Gluthation peroxydase	Lactate dehydrogenase	Catalase	Myeloperoxydase	Pyruvate kinase
1044	1	What action does pancreatic juice have on carbohydrate digestion?	All of the above	Converts sucrose to glucose and fructose	Converts polysaccharides and starches to maltose	Converts lactose to glucose and galactose	Converts maltose to glucose
1045	1	Bile acids are derivatives of :	Cholesterol	Heme	Sphinhomyeline	Phosphatidyl choline	Long chain fatty acids
1046	1	In digestion of dietary lipids there is need in one of the digestive secrets. What secre from listed below take part in lipids emulsification?	Bile	Intestinal juice	Pancreatic juice	Saliva	Gastric juice
1047	1	In the course of the investigation of secretory gastric function a hypochlorhydria was recognized. Activity of what enzyme will be decreased in this condition?	Pepsin	Hexokinase	Dipeptidase	Amylase	Lipase
1048	1	In a patient in the course of the investigation of gastric juice lactic acid was detected. The latter was detected by:	Uffelman reaction	Urease test	Benzidine test	Resorcinol test	Fehling test

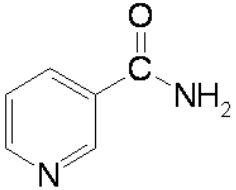
1049	1	In a child, consuming a meal of plant origin exclusively after some period a growth retardation, anemia and kidney impairment were observed. The cause of this state is deficiency in diet of the next nutrients:	Essential amino acids	Carbohydrates	Lipids	Mineral macroelements	Carotene
1050	1	In a patient in the course of the clinical and laboratory investigation in gastric juice a compound was detected, suggesting a malignant tumor in stomach. This compound may be:	Lactic acid	Rennin	Pepsinogen	Pepsin	Castle intrinsic factor
1051	1	A dentist with the aim of plague prophylaxis administered a 2 year child a medication, containing:	F	I	Br	Fe	Mn
1052	1	A patient, living in the mountain region, has an enlarged thyroid gland. This is most evidently caused by the deficiency of the following trace element in food:	I	Br	F	Fe	Mn
1053	1	The cause of endemic goiter is deficiency of trace element:	Iodine	Zinc	Copper	Iron	Maganese
1054	1	In the piece of gastric mucosa, excised from patient with gastric ulcer disease, Helicobacter pylori was detected. What enzyme can be detected simultaneously in the tissue specimen?	Urease	Dehydrogenase	Alanine AT	Aspartate AT	Carboxypeptidase
1055	1	Trypsinogen is produced in exocrine part of pancreatic gland and excreted to duodenum, where it is activated by the next factor:	Enteropeptidase	Chymotrypsinogen	Secretin	Gastrin	Cholecystopancreozymine

1056	1	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:	Perchloric acid	Sulfuric acid	Acetic acid	Bile acids	Amino acids
1057	1	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?	Trypsin, chemotrypsin	Enterokinase, lipase	Amylase, maltase	Pepsin, gastricsin	Lipase, phospholipase
1058	1	It is required to measure the nitrogen metabolism in a person under observation who is recovering from continuous starvation. What result is most likely to be expected?	Decrease in nitrogen secretion	Nitrogen equilibrium	Negative nitrogen balance	Acetonemia	-
1059	1	Study of secretory function of stomach revealed a decrease in hydrochloric acid concentration in gastric juice. This must cause hypoactivity of the following enzyme:	Pepsin	Hexokinase	Amylase	Lipase	Dipeptidase
1060	1	In the course of an experiment in the mesenteric vein of a toad a trombus was created with a crystal of common salt. What processes occurred during the first stage of trombus formation?	Adhesion, aggregation, agglutination of platelets	Production of active thromboplastin	Production of thrombin	Production of fibrin monomer	Production of fibrin polymer
1061	1	In a patient with frequent intraorgan and mucosal bleeding in urine were detected proline and lysine. Deficiency of what vitamin cause a damage of their hydroxylation?	Vitamin C	Vitamin A	Vitamin K	Vitamin D	Vitamin E

1062	1	In a patient painfulness along a great nerve trunks is observed as well as increase of pyruvate in blood. Insufficiency of what vitamin may induce these symptoms?	Vitamin B_1	Vitamin C	Vitamin B_6	Vitamin K	Vitamin PP
1063	1	Malignant hyperchrome anemia, or Birmer's disease, is a pathological state caused by the deficiency of vitamin $B_{12.}$ What chemical element is a constituent of the structure of this vitamin?	Cobalt	Zinc	Iron	Magnesium	Molybdenum.
1064	1	In a patient with symptoms of enhanced blood coagulability (thromboses, thrombophlebitis) heparin was injected, never the less coagulation was not inhibited. What protein factor deficiency of anticoagulant system may exists in a patient?	Antithrombin III	α_2-Macroglobulin	αI –inhibitor of proteinases	Antithromboplastine	Anticonvertin
1065	1	An examination of a patient revealed hyperglycemia, ketonuria, polyuria, and glycosuria. What type of disorder of acid-base balance is observed in this case?	Metabolic acidosis	Respiratory alkalosis	Metabolic alkalosis	Respiratory acidosis	-
1066	1	Patient was transported to the clinic with inherited hemophilia A, which is manifested in prolonged bleeding. The cause of hemophilia A might be a deficiency of:	Antihemophilic globulin A	Prothrombin	Fibrinogen	Antihemophilic globulin B	-
1067	1	In the blood serum of a patient a marked decrease of albumins and fibrinogens levels were detected. Which organelles' activity of liver hepatocytes is reduced?	Granular endoplasmic reticulum	Lysosomes	Mitochondria	Golgi complex	-
1068	1	Ionized copper was observed in the urine of a patient, as well as its delay in several organs and tissues. Biosynthesis of what protein is abolished?	Ceruloplasmin	C reactive protein	Transferrin	Cryoglobulin	Haptoglobin

1069	1	Examination of a child revealed staphylococcus infection. What changes in protein composition in blood are the most typical for this condition?	Identification of C - reactive protein	Decreasing of the amount of albumins	Decreasing of the amount of fibrinogen	Increased albumin content	Decreasing of the amount of ceruloplasmin
1070	1	Laboratory analysis revealed low blood pH value, low concentration of hydrogen carbonate (alkaline reserve of blood), increased content of lactic and pyruvic acids in blood and urine. What type of the acid-alkaline balance is disturbed?	Metabolic acidosis	Respiratory acidosis	Metabolic alkalosis	Respiratory alkalosis	Respiratory alkalosis
1071	1	Examination of a patient revealed a nephrotic syndrome. What changes in protein fractions of blood are expected?	Decreased concentration of albumines	Decreased concentration of α_1-globulins	Increased concentration of β-globulins	Decreased concentration of γ-globulins	Increased concentration of α_2-globulins
1072	1	As a result of cyanide poisoning blockade of tissue enzymes (cytochromes) occurs. What type of hypoxia might be observed in these conditions?	Hemic	Hypoxic	Circulatory	Respiratory	Tissue
1073	1	In a child during the first three months after birth a severe form of hypoxia was indicated. The reason for this might be a disorder of the replacement of fetal hemoglobin to:	Hemoglobin A	Methemoglobin	Hemoglobin C	Hemoglobin S	Hemoglobin M
1074	1	In a patient with glomerulonephritis a nitrogenemia is observed. What substance makes the greatest contribution to the rest nitrogen?	Urea	Amino acids	Creatinin	Uric acid	Ammonia salts
1075	1	According to blood analysis of the patient the rest nitrogen consists 48 mmols/l, urea – 15.3 mmols/l. What organ disease may cause such results of laboratory investigation?	Kidneys	Liver	Stomach	Spleen	Intestines

1076	1	Which of the following drugs would be best to use on a patient who has just had a heart attack?	Heparin	Tissue plasminogen activator	Dicoumarol	Warfarin	Thrombin
1077	1	Which of the following immunoglobulins is a secretory component of saliva and inhibits the adsorption of bacteria on tooth enamel?	IgA	IgM	IgD		IgE
1078	1	Patient with the symptoms of the increased blood coagulation (thromboses, thrombophlebitis) was treated parenterally with an anticoagulant – heparin. However the speed blood coagulation did not decreased. The deficit of what protein factor of the anticoagulation system of blood is observed?	Antithrombin III	α_2-macroglobulin	α_1-inhibitor of proteinases	Antithromboplastin	Anticonvertin
1079	1	In the patients blood there was detected certainly high activity of protrombin that is the threat of vessels thrombosis. What preparation should be used in this case?	Heparin	Potassium oxalate	Sodium citrate	Sodium oxalate	Ethylene diamine tetra acetate
1080	1	During the test on AIDS there were got two positive results of imunoenzyme analysis (IEA). What method might be used for the exception of pseudopositive result got with IEA?	PCR	Radioimmune analysis	Luminescence analysis	Immunofluorescence	Molecular hybridization
1081	1	In fecal masses of newborn child consuming a natural feeding high content of IgA was detected. This condition depends from:	High content of IgA in mother's milk	Increased synthesis of IgA	Decreased synthesis of IgM	Decreased synthesis of IgD	Increased synthesis of IgA and IgM

1082	1	Patient was transported to the clinic with suspicion on the myocardial infarction. For the prophylaxis of thrombogenesis he was prescribed a preparation of fibrinolysine (plazmin), which catalyze transformation of?	Fibrine into peptides	Fibrinogen into fibrin	Protrombin into trombin	Proconvertin into convertin	Plasminogen into plasmin
1083	1	Streptokinase as a medical preparation is used for revascularization of occluded by thrombus blood vessels. It possesses the following biological activity:	Activates plasminogen	Arrests the polymerization of fibrin monomers	Inhibits cross linking of fibrin filaments	Dissolves fibrin filaments by proteolysis	Inhibits the activity of thrombin
1084	1	In blood serum of a patient a marked increase in activity of trypsine, alpha-amylase and lipase was detected. What disease can be considered?	Acute pancreatitis	Cholestasis	Chronic hepatitis	Malignant tumors	Insecticide poisoning
1085	1	Blood plasma proteins of a healthy person were resolved by electrophoresis at pH 8,6 into several fractions. What fraction possesses the greatest electrophoretic mobility in indicated conditions?	γ–Globulin	α–Globulin	β–Globulin	Albumin	Fibrinogen
1086	1	Which of the following names corresponds with the formula: 	Nicotinic acid amide	Isonicotinic acid amide	Picolinic acid amide	Salicylic acid amide	Anthranilic acid amide
1087	1	Blood serum electrophoresis revealed interferon. This protein is in the following fraction:	γ-globulins	α1-globulins	α2-globulins	β-globulins	Albumins

1088	1	A patient has been hospitalized for chronic heart failure. Objectively: skin and mucous membranes are cyanotic, the patient has tachycardia, tachypnea. What type of hypoxia has developed in the patient?	Circulatory	Anemic	Hemic	Tissue	Hypoxic
1089	1	Urine analysis revealed a decrease in sodium ion concentration. Which hormone provides an enhanced reabsorption of sodium ions in the convoluted nephron tubules?	Aldosterone	Vasopressin	Somatostatin	Adrenaline	Acetylcholine
1090	1	A hospital admitted a patient with arterial hypertension induced by renal artery stenosis, complaints of persistent nausea and headache. The main element in the pathogenesis of hypertension is the activation of the following system:	Renin-angiotensin	Hypothalamic-pituitary	Kallikrein-kinin	Sympathoadrenal	Parasympathetic
1091	1	A patient with pneumosclerosis has blood pH at the rate of 7,34. Analysis of gas formula of blood showed hypercapnia. Urine analysis revealed an acidity increase. What form of acid-base disbalance is the case?	Gaseous acidosis	Secretory alkalosis	Gaseous alkalosis	Non-gaseous alkalosis	Non-gaseous acidosis
1092	1	A 28-year-old male got a burn that caused an increase in spontaneous secretion of gastric juice. It is associated with secretion of the following substance:	Histamin	Secretin	Gastric inhibitory peptide	Cholecystokinin-Pancreozymin	Serotonin
1093	1	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	Glutaminase	Succinate dehydrogenase	Citrate synthetase	Aspartate aminotransferase

1094	1	Blood pressure is regulated by a number of biologically active compounds. What peptides that enter the bloodstream can affect the vascular tone?	Kinins	Leukotrienes	Enkephalins	Iodothyronines	Endorphins
1095	1	Caffeine inhibits phosphodiesterase which converts cAMP to AMP. The most typical feature of caffeine intoxication is the reduced intensity of:	Glycogen synthesis	Protein phosphorylation	Pentose phosphate pathway	Glycolysis	Lipolysis
1096	1	A dentist with the aim of plague prophylaxis administered a 2 year child a medication, containing:	F	J	Br	Fe	Mn
1097	1	e examination of the patient evaluated the liver alteration, accompanied by hyperammoniemia, hyperacidaemia, aminoaciduria and frequent faintings. Which acid is effective for the ammonia bonding in the brain?	Glutamate	Isocitrate	Succinate	Fumarate	Oxoloacetate
1098	1	Which of the mentioned below tissues is the most sensitive to hypoxia?	Nervous	Epithelial	Fatty	Muscular	Bone
1099	1	A pregnant woman developed severe toxemia with exhausting recurrent vomiting throughout a day. By the end of the day she developed tetanic convulsions and bodily dehydration. The described changes were caused by the following type of acid-base disbalance:	Nongaseous excretory alkalosis	Gaseous alkalosis	Gaseous acidosis	Nongaseous metabolic acidosis	Nongaseous excretory acidosis

1100	1	A patient suffers from mutation of a gene that corresponds with hemoglobin synthesis. This condition led to development of sicklecell disease. Name the pathological hemoglobin characteristic of this disease:	HbS	HbA	HbF	HbA1	Bart-Hb
1101	1	Characteristic sign of glycogenosis is muscle pain during physical work. Blood examination usually reveals hypoglycemia. This pathology is caused by congenital deficiency of the following enzyme:	Glycogen phosphorylase	Glucose 6-phosphate dehydrogenase	α-amylase	γ-amylase	Lysosomal glycosidase
1102	1	A 50-year-old woman diagnosed with cardiac infarction has been delivered into an intensive care ward. What enzyme will be the most active during the first two days?	Aspartate aminotransferase	Alanine aminotransferase	Alanine aminopeptidase	LDH4	LDH5
1103	1	Experimental stimulation of sympathetic nerve branches that innervate heart caused an increase in force of heart contractions because membrane of typical cardiomyocytes permitted an increase in:	Calcium ion entry	Calcium ion exit	Potassium ion exit	Potassium ion entry	Calcium and potassium ion exit
1104	1	A 46-year-old female patient has continuous history of progressive muscular (Duchenne's) dystrophy. Which blood enzyme changes will be of diagnostic value in this case?	Creatine phosphokinase	Lactate dehydrogenase	Pyruvate dehydrogenase	Glutamate dehydrogenase	Adenylate cyclase
1105	1	Untrained people often have muscle pain after sprints as a result of lactate accumulation. This can be caused by intensification of the following biochemical process:	Glycolysis	Gluconeogenesis	Pentose phosphate pathway	Lipogenesis	Glycogenesis

1106	1	A patient is diagnosed with cardiac infarction. Blood test for cardiospecific enzymes activity was performed. Which of the enzymes has three isoforms?	Creatine kinase	Lactate dehydrogenase	Aspartate transaminase	Alanine transaminase	Pyruvate kinase
1107	1	A biochemical urine analysis has been performed for a patient with progressive muscular dystrophy. In the given case muscle disease can be confirmed by the high content of the following substance in urine:	Creatine	Porphyrin	Urea	Hippuric acid	Creatinine
1108	1	For biochemical diagnostics of myocardial infarction it is necessary to measure activity of a number of enzymes and their isoenzymes. What enzymatic test is considered to be the best to prove or disprove the diagnosis of infarction in the early period after the chest pain is detected?	Creatine kinase isoenzyme CK-MB	Creatine kinase isoenzyme CK-MM	LDH1 lactate dehydrogenase isoenzyme	LDH2 lactate dehydrogenase isoenzyme	Aspartate aminotransferase cytoplasmiciso enzyme
1109	1	12 hours after an accute attack of retrosternal pain a patient presented a jump of aspartate aminotransferase activity in blood serum. What pathology is this deviation typical for?	Myocardium infarction	Viral hepatitis	Collagenosis	Diabetes mellitus	Diabetes insipidus
1110	1	6 hours after the myocardial infarction a patient was found to have elevated level of lactate dehydrogenase in blood. What isoenzyme should be expected in this case?	LDH1	LDH2	LDH3	LDH4	LDH5

1111	1	A 5-month-old boy was hospitalized for tonic convulsions. He has a lifetime history of this disease. Examination revealed coarse hair, thinned and fragile nails, pale and dry skin. In blood: calcium - 1,5 millimole/l, phosphor - 1,9 millimole/l. These changes are associated with:	Hypoparathyroidism	Hyperparathyroidism	Hyperaldosteronism	Hypoaldosteronism	Hypothyroidism
1112	1	Anaerobic glycolysis occur under conditions of relative oxygen insufficiency. This biochemichal process is accompanied by the pH decrease in tissues resulting from the accumulation of:	Lactate	Citrate	Oxaloacetate	Succinate	Fumarate
1113	1	The fastest mechanism of ATP production for the urgent muscular contraction is:	ATP generation from creatine phosphate	Aerobic glycolysis	Anaerobic glycolysis	Glycogenolysis in muscles	Triglicerides oxidation
1114	1	In muscular dystrophies the production and excretion of creatinine is inhibited. But what index is increased in urine under these conditions?	Creatine	Urates	Porphyrins	Indicanes	Bilirubin
1115	1	Organ-specific enzymes are evaluated for the diagnosis of some diseases. What enzymes are determined to diagnose muscular dystrophies?	Aspartate aminotransferase, kreatine kinase	Arginase, pyruvate decarboxylase	Alanine aminotransferase, urease	Hexokinase, phosphorylase	Fumarase, superoxide dismutase
1116	1	The huge amount of nitrogen, derived from the amino acids, is excreted from the human organism with urea in the form of creatinine. Which amino acids participate in biosynthesis of creatine?	Glycine, arginine, methionine	Glycine, phenylalanine, cysteine	Valine, serine, tyrosine	Tryptophan, lysine, alanine	Leucine, histidine, glutamine

1117	1	Indicate the right sequence of the biochemical information transfer in the mechanism of muscular contraction?	Ca → Troponin → Tropomyosin → Actin → Myosin	Ca → Troponin → Tropomyosin → Myosin → Actin	Ca → Actin → Myosin → Troponin → Tropomyosin	Ca → Tropomyosin → Troponin → Actin → Myosin	Ca → Tropomyosin → Troponin → Myosin → Actin
1118	1	The sportsman ran a marathon distance, resulting in a production of lactate in his muscles. The biggest amount of this lactate:	Gets to blood, is caught by liver where it is converted to glucose	Gets to mitochondrias and is oxidized to pyruvate	Is excreted with urea	Is used for the glucose synthesis in the muscular tissue	Is accumulated in the organism, causing acidosis
1119	1	What reaction in skeletal muscles causes ATP production for the urgent muscular contraction?	Creatine phosphokinase	Phosphofructokinase	Adenylate kinase	Glucokinase	Hexokinase
1120	1	A 30 year old patient manifested a decreased tolerance to physical exercises, whereas the content of glycogen in his muscles increased. The decrease of what enzyme caused this condition?	Glycogen phosphorylase	Phosphofructokinase	Glycogen synthase	Fumarase	Succinate dehydrogenase
1121	1	The main biochemical regulator of the muscular contraction and relax is the change of the ions of:	Ca2+	K+	Mg2+	CI-	Na+
1122	1	In the course of studies it was evaluated that muscular contraction needs energy in the form of:	ATP	GTP	CTP	ADP	AMP
1123	1	The fibrillar proteins include:	F-actin	Myosin	Troponin	Tropomyosin	a- and b -actinin

1124	1	During water extraction of muscular and nervous tissue the following compounds are released into the water solution:	Anserine	GABA	Carnosine	Creatine	Cholesterol
1125	1	In which organs is creatine phosphate synthesized?	Kidneys and liver	Adrenal glands	Lungs	Pancreas	Spleen
1126	1	Which statements on the white muscular fibers are right?	They are characterized by anaerobic carbohydrates catabolism	Contain more glycogen than the red fibers	Fatigue faster compared to the red fibers	Contract faster than the red fibers	Contain more hemoglobinum than the red fibers
1127	1	Calcium ions binds with the highest affinity with the next myofibrillar protein:	Troponin C	Actin	Tropomyosine	Troponine I	Myosine
1128	1	Creatine is reversibly phosphorylated by the following macroergic compound:	ATP	Phosphoenolpyruvate	Carbamoyl phosphate	NADP	UTP
1129	1	The end product of creatine catabolism, which is excreted with urine is the next compound:	Creatinine	Cretine phosphate	Uric acid	Urea	β-Alanine
1130	1	What amino acid derivative excreted with urine may serve as indicator of muscle tissue damage?	Methylhistidine	Indolilacetate	Mandelic acid	Citrulline	Isovaleric acid

1131	1	Duchenne's myodystrophy is hereditary disease caused by mutation of specific gene in X chromosome. Deficiency of what protein as gene product is involved in the mechanism of disease manifestation?	Dytrophin	Myosine	Actine	Troponin	Nebulin
1132	1	People after prolong hypodynamia after intensive physical exercises manifest severe pain in muscles. What is the most probable cause of such a phenomenon?	Hyperproduction and retention of lactate in muscles	Decrease of lipids in myocytes	Increase of ADP in myocytes	Accumulation of creatinine in muscles	Increased proteolysis in muscles
1133	1	Tetanus toxin induces tonic straining of skeletal and vessel muscles due to inhibition of secretion by nerve endings such neurotransmitter as:	GABA	Norepinephrine	Acetylcholine	Glycine	Glutamate
1134	1	What motor proteins analogous to myosin provide intracellular transport of subcellular particles?	Dynein and kinesin	Actinin	Vimentin and integrin	Titin and nebulin	Tubulin and actin
1135	1	Creatin phosphate is synthesized in the next cell compartment:	Mitochondria	Endoplasmic reticulum	Lysosomes	Nucleus	Cell cytoplasm
1136	1	Chose the substance which triggers directly the contraction of myofibril of skeletal muscle:	Ca ions	Creatine	Creatine phosphate	ATP	cAMP
1137	1	Hepatitis, myocardial infarction induce an acute increase of alanine- and aspartate aminotransferase in patient's blood? What is the cause of the increase of these enzymes?	The damage of cell membrane and passage of the enzymes to blood	Increased rate of amino acid synthesis in tissues	Increased rate of amino acids breakdown in tissues	Lack of pyridoxin	Increase of the enzyme activity by the hormones

1138	1	Muscular tissue is capable to contract. This is provided by the presence of:	Actin and myosin	Fibrinogen	Creatinine	Thrombin	Hemoglobin
1139	1	A 40 year old man ran 10 km within 60 minutes. Which changes of the energetic metabolism will occur in his muscles?	The rate of fatty acids oxidation will increase	Proteolysis will increase	Gluconeogenesis will increase	Glycogenolysis will increase	Glycolysis will increase
1140	1	McArdle's disease is characterized by the following clinical signs: excessive glycogen accumulation in muscles, progressive myopathy, manifested by painful seizures after muscular work, myoglobulinuria. At the same time the lactate content in blood is not changed or decreased. The lack of what enzyme of glycogen metabolism causes this disease?	Glycogen phosphorylase	Adenilate cyclase	Glycogen synthase	Kinase of phosphorylase	Protein kinase
1141	1	Normal value of this protein marker in health makes up 80 ng/l. In myocardial infarction its concentration is acutely increased within first 2 hours and then gets significantly decreased due to excretion with urea. Name this protein.	Myoglobin	Tropomyosin	Actin	Hemoglobin	Myosin
1142	1	The deficiency of myoadenilate desaminase, the enzyme catalizing irreversible desamination of AMP to IMP induces fast fatigue during physical exercises as well as delayed onset muscle soreness and muscular pain. This myopathy is caused by:	The disturbance of purins metabolism	Accessive accumulation of fatty acids	Insufficient carnitine content	The disturbance of glycogen metabolism	The changes of the number of mitochondrias, their size and internal structure

1143	1	The oxidation of noncarbohydrate compounds (mainly fatty acids) provides 65-70% of energetic needs of the myocard. Which of the free fatty acids is the most easily oxidized in heart muscle?	Oleic acid	Palmitic acid	Stearic acid	Arachidonic acid	Linolic acid
1144	1	Myofibrillar proteins are the proteins providing muscular contractions. Which of the following proteins exert ATP-ase activity?	Myosin	Actin	Troponin T	Troponin I	Troponin C
1145	1	The changes of the cytoplasm concentration of calcium ions are the main biochemical regulator of the muscular contraction and relax. What component of the troponin system is activated by the increased calcium concentration?	Troponin C	Myosin	Actin	Troponine T	Troponin I
1146	1	In long-term rhythmic muscular work ATP in muscles is synthesized by means of oxidation of:	Lipids	Lactate	Glucose	Glycogen	Aminoacids
1147	1	The contraction of the smooth muscles when the calcium concentration increases up to 10μm is significantly different from the analogic process in the barred muscles and is initiated by means of bonding of calcium to:	Calmodulin	Actin	Myosin	Troponin C	Troponin I
1148	1	The excessive intake of vitamin A is accompanied by increased membrane permeability or membrane destruction with the release of the acid proteases and acid phosphatase from the lysosomes, The excretion of what muscular cells metabolite is indicative for their damage?	Creatine	Lactate	Pyruvate	Creatinine	Glucose

1149	1	What effect of magnium ions on the muscular tissue causes the wide use of the magnium-containing drugs in clinical practice?	Decreases calcium concentration	Activates troponin complex	Increases calcium concentration	Enhances the nervous impulses transfer in the synapses	Increases ATP and phosphate concentration
1150	1	A 1 year child got to clinic with the signs of muscular involvement. The examination evaluated carnitine deficiency in muscles. The disturbance of what process is the biochemical background for this pathology?	The fatty acids transport to mitochondrias	Regulation of Ca2+ level in mitochondrias	Substrate phosphorylation	Lactate utilization	Actin and myosin synthesis
1151	1	A child with signs of rickets has been prescribed a certain liposoluble vitamin drug by pediatrician and dentist. This drug affects the metabolism of phosphorus and calcium in the body and facilitates calcium accumulation in bone tissue and dentine. If its content in the body is insufficient, there develop disruptions of ossification process, dental structure and occlusion. Name this drug:	Ergocalciferol	Retinol acetate	Tocopherol acetate	Menadione (Vicasolum)	Thyroidin
1152	1	Osteolaterism is charcterized by a decrease in collagen strength caused by significantly less intensive formation of cross-links in collagen fibrils. This phenomenon is caused by the low activity of the following enzyme:	Lysyl oxidase	Monoamine oxidase	Prolyl hydroxylase	Lysyl hydroxylase	Collagenase

1153	1	Calcification of dental tissues is significantly influenced by osteocalcin protein that can bind calcium ions due to the presence of the following modified amino acid residues in the polypeptide chain:	γ-carbon glutamine	Alanine	γ-aminobutyric	Carboxy aspargine	δ-aminopropionic
1154	1	Calcification of the intercellular substance of bone tissue is accompanied by the deposition of hydroxyapatite crystals along the collagen fibers. This process requires the presence of alkaline phosphatase in the intercellular substance. What cell produces this enzyme?	Osteoblast	Osteocyte	Osteoclast	Chondroblast	Chondrocyte
1155	1	A 34-year-old patient has a history of periodontitis. As a result of increased collagen degradation, there is a significantly increased urinary excretion of one of the amino acids. Which one?	Hydroxyproline	Valine	Alanine	Glycine	Serine
1156	1	When a wound heals, a scar takes its place. What substance is the main component of its connective tissue?	Collagen	Elastin	Keratan sulfate	Chondroitin sulfate	Hyaluronic acid
1157	1	A patient has a slowly healing fracture. What medicine can be used to accelerate formation of connective tissue matrix?	Methyluracil	Prednisolone	Cyclophosphan	Methotrexate	Cyclosporine
1158	1	Wound healing is accompanied by the development of a connective tissue cicatrice which is formed on the site of the tissue defect. What cells are responsible for this process?	Fibroblasts	Macrophages	Fibrocytes	Mastocytes	Melanocytes

1159	1	A 35-year-old female patient with a chronic renal disease has developed osteoporosis. The cause of this complication is the deficiency of the following substance:	1,25-dihydroxy-D_3	25-hydroxy-D_3	D_3	D_2	Cholesterol
1160	1	In spring a patient experiences petechial haemorrhages, loosening of teeth, high liability to colds. A doctor suspects hypovitaminosis C. In this respect loosening of teeth can be explained by:	Structural failure of collagen in the periodontal ligaments	Structural change of glycosaminoglycans	Increased permeability of periodont membranes	Mechanical damage of teeth	Disturbed oxidation-reduction process in the periodont
1161	1	A 53-year-old man is diagnosed with Paget's disease. Concentration of oxyproline in daily urine is sharply increased, which primarily means intensified disintegration of:	Collagen	Keratin	Albumin	Hemoglobin	Fibrinogen
1162	1	Exophthalmus observed during thyrotoxicosis is caused by accumulation of highly water-binding substances within the retrobulbar tissues. Name these substances:	Glycosaminoglycans	Cholesterol	ATP	Kreatine	Phospholipids
1163	1	During regular check-up a child is detected with interrupted mineralization of the bones. What vitamin deficiency can be the cause?	Calciferol	Riboflavin	Tocopherol	Folic acid	Cobalamin
1164	1	A patient with signs of osteoporosis and urolithiasis has been admitted to the endocrinology department. Blood test revealed hypercalcemia and hypophosphatemia. These changes are associated with abnormal synthesis of the following hormone:	Parathyroid hormone	Calcitonin	Cortisol	Aldosterone	Calcitriol

1165	1	A 36 year old female patient has a history of collagen disease. Urine analysisis likely to reveal an increased concentration of the following metabolite:	Oxyproline	Indican	Creatinine	Urea	Urobilinogen
1166	1	What biochemical process is not typical for connective tissue of elderly persons?	Reduction of collagen	Reduction of water	Increasing of collagen	Reduction of glycosaminoglycans	Reduction of hyaluronic acid
1167	1	What amino acids are rare in elastin - a protein component of elastin fibers?	Nonpolar	Polar	Acidic	Basic	-
1168	1	Name hormones that inhibit synthesis of proteoglycans and collagen in connective tissue:	Glucocorticoids	Somatomedins	Somototropin	Insulin	Androgens
1169	1	Increased content of oxyproline in blood and urine with lesions of joints and bones is observed due to increased catabolism of:	Collagen	Hyaluronic acid	Glycosaminoglycans	Proteoglycans	Elastin
1170	1	What amino acids, which comprise the structure of collagen, are genetically encoded?	Hydroxyproline, hydroxylisine	Serine, glycine	Alanine, valine	Glutamic acid, glutamine	Phenylalanine, tryptophan
1181	1	Influence of hypovitaminosis C on the structure of collagen fibers caused by decreased activity of enzymes:	Lysyl hydroxylase, proline hydroxylase	Lysyl oxidase, lysyl hydroxylase	Glycosil transferase	Procollagen peptidase	Collagenase

1182	1	Hydroxyproline is an important amino acid within the collagen biosynthesis. Indicate vitamin which is participated in the formation of this amino acid by hydroxylation of proline?	C	B_1	D	B_2	B_6
1183	1	Indicate the most common amino acid residues in collagen.	Oxyproline, oxylysine, glycine, proline	Tryptophan, cysteine, glycine, methionine	Lysine, arginine, cysteine, tryptophan	Tryptophan, oxylysine, cysteine, valine	Asparagine, glutamine, lysine
1184	1	Gram-positive bacteria produce a protective capsule of hyaluronic acid, which increases their pathogenicity. What enzyme can "destroy" the protective capsule?	Hyaluronidase	Carboxypeptidase	Aminopeptidase	Alpha glycosidase	Collagenase
1185	1	What class of glycosaminoglycans, due to the large number of carboxyl groups, binds large amounts of water and supports tissue turgor?	Hyaluronic acid	Dermatan sulfate	Keratan sulfate	Heparin	Chondroitin sulphate
1186	1	Insolubility of collagen connective tissue and its metabolic resistance to various agents is caused by amino acid composition and special structure of the protein. Indicate amino acids that quantitatively dominate in the structure of collagen?	Glycine, proline, alanine	Methionine, serine, threonine	Phenylalanine, tyrosine, tryptophan	Cysteine, threonine, glutamine	Arginine, histidin, phenylalanine
1187	1	Protein procollagen is synthesized by fibroblasts of connective tissue. Thereafter glycosylation occurs. What carbohydrates bind to procollagen?	Galactose, glucose	Fructose, mannose	Ribose, deoxyribose	Arabinose, sucrose	Ribulose, xylulose

1188	1	Collagen and elastin are fibrillar elements of connective tissue. Specify the amino acid, which is a component only of the collagen and its determination is used to diagnose several disorders of connective tissue:	Hydroxyproline	Proline	Glycine	Lysine	-
1189	1	In a 63 years old women suffering from rheumatism, increased concentration of oxyproline in blood and urine was detected. What is the main reason of this state?	Degradation of collagen	Activation of prolyl hydroxylase	Renal impairment	Activation of cathepsins	-
1190	1	Results of blood and urine tests indicate that the content of glucuronic and sialic acids are above normal. Catabolism of which of the following compounds is enhanced?	Glucosamine glican	Glycoprotein	Collagen	Elastin	Calmodulin
1191	1	For the resorption of keloids a hyaluronidase is used. What biochemical process causes advantages of enzymotherapy?	Cleavage of hyaluronic acid	Cleavage of heparin	Cleavage of chondroitin sulfate	The synthesis of glycosaminoglycans	Cleavage of collagen
1192	1	Mukopolysaccharydoses are hereditary diseases that manifested pathological changes during bones and joints formation. What urine index indicates this disease?	Excessive excretion of glycosaminoglycans	Excessive excretion of amino acids	Excessive excretion of lipids	Excessive excretion of glucose	Excessive excretion of proteins
1193	1	A patient was hospitalized with impaired vascular permeability. Specify the protein of connective tissue which is disturbed at such conditions.	Collagen	Myoglobin	Albumin	Tropomyosin	Ceruloplasmin

1194	1	Examination of a 2 years old child revealed deformation of the spine, joints; lagging in growth, progressive coarsening of the face, deafness, thickening of the skin. Increased excretion of dermatine sulfate and heparin sulfate were determined in urine. Deficit of which from the following enzymes caused these changes?	α-L-iduronidase	N-sulfamidase	N-acetyl glucose aminidase	Glucose-6-phosphatase	β-glucoseamine–N-acetyltransferase
1195	1	In inflammatory diseases of joints decreasing in viscosity of synovial fluid is observed. The reason of this disorder might be:	Reducing of the number and depolymerization of hyaluronic acid	Reduction of the number and depolymerization of proteoglycans	Reducing of the number and depolymerization of glycoproteins	Reduction of protein concentration	Reducing of the number and depolymerization of chondroitin sulfate
1196	1	In a patient with scurvy a disorder of hydroxylation of proline and lysine within the collagen molecule was observed. What biochemical process is inhibited?	Microsomal oxidation	Oxidative phosphorylation	Lipid peroxidation	Peroxidase oxidation	Tissue respiration
1197	1	Examination of a patient with Slaj syndrome revealed urinary excretion of heparin sulphate and chondroitin sulfate. This condition is likely to be caused by the deficiency of the following substance.	β-Glucuronidase	α-amylase	Lactate dehydrogenase	Arylsulfatase A	Cathepsin D
1198	1	Treatment of enamel erosion with dissolved in oil vitamin D_3 was ineffective. The main reason for this may be a disorder of:	Bile production	Functioning of gonads	Digestion of carbohydrates	Digestion of proteins	Functioning of the pancreas