

| № теми | Назва теми | Кількість запитань на контрольну роботу | Кількість запитань всього |
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| 1 | 1 | 40 | 826 |

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| 1 | 1 | What substance mediates the viscosity of saliva and protects oral mucosa against harmful agents and mechanical damage? | Mucine | Lysozyme | Amylase | Kallicreine | Glucose |
| 2 | 1 | Concentration of proton ions in saliva of healthy adults corresponds to pH 6.4-7.8. What process in enamel is favored during shift of salivary pH to acidic side (pH below 6.2)? | Surface enamel demineralization | Calcification | Mineralization of enamel surface | Increase in resistancy to acids | Fluorosis |
| 3 | 1 | Normal pH of saliva is 6.4-7.8. The shift of pH to alkaline side (pH 7.8) favors the next process: | Deposition of Ca and phosphate ions into surface of enamel | Decrease in resistance of tooth tissue to the action of cariesogenic factors | Enamel demineralization | Release of calcium from tooth tissue | Release of phosphate from tooth tissue |
| 4 | 1 | Decrease in activity of what enzyme indicates on the hypofunction of parotid gland? | Amylase | Glucokinase | Maltase | Lysozyme | Phosphatase |
| 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 |

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| 6 | 1 | One of the functions of saliva is a protective function. It consists in formation of local resistance of mucosa towards bacteria due to secretion of the following protein by the parotid glands: | Secretory IgA | Elastine | Collagene | Fibrinogene | Albumin |
| 7 | 1 | In intact cell, the free energy change ($\Delta G'$) 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 | What component of saliva is produced by salivary glands as well as other glands and provides its viscosity? | Mucine | Phosphates | Amylase | Maltase | Hyaluronic acid |
| 10 | 1 | Rotenone is known to inhibit respiratory chain. What complex of mitochondrial respiratory chain is inhibited by this substance? | NADH-coenzyme Q reductase | Succinate-coenzyme Q reductase | Cytochrome oxidase | Adenosine triphosphate synthetase | Coenzyme Q - cytochrome c reductase |
| 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 | A doctor has made a diagnosis of gingivitis and recommended the patient to rinse the oral cavity with an oxidizing agent. Specify this agent: | Hydrogen peroxide | Boric acid | Salicylic acid | Phenol | Brilliant green |

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| 13 | 1 | A patient came to the doctor with complaints of general weakness and sleep disturbances. Objectively the patient's skin is yellow. In blood there is increased concentration of direct bilirubin and bile acids. Acholic stool is observed. What condition can be characterized by these changes? | Mechanical jaundice | Hemolytic jaundice | Parenchymatous jaundice | Familial nonhemolytic (Gilbert's) syndrome | Chronic cholecystitis: |
| 14 | 1 | Protective function of saliva is provided by several mechanisms, one of them includes enzyme, which exhibits bactericidal effect by cleavage a polysaccharide complex of cell wall of staphylococci and streptococci. How is this enzyme called? | Lysozyme | Collagenase | α -Amylase | Oligo-1,6-glucosidase | β -Glucuronidase |
| 15 | 1 | A patient presents with osteoporosis. Hypercalcemia and hypophosphatemia are observed in the patient's blood. What is the cause of this condition? | Increased parathormone secretion | Inhibited corticosteroid secretion | Hydrolases | Increased thyroxin secretion | Inhibited parathormone secretion |
| 16 | 1 | Mucine is one of the principal constituents of saliva. Based on its chemical composition it belongs to the next class of conjugated proteins: | Glycoproteins | Nucleoproteins | Phosphoproteins | Lipoproteins | Metalloproteins |
| 17 | 1 | A number of factors are known to be able to change pH in the oral cavity. What consequences has a decrease of pH of oral fluid below 6.4? | Enamel demineralization and caries development | Activation of starch breakdown | Enhancement of enamel mineralization | Lowering of protective properties of oral fluid | Deterioration of oral cavity hygiene |
| 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 |

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| 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 | Note the optimal range of oral fluid pH for favourable mineralization and remineralization of tooth tissue. | 7.2-7.4 | 7.4-7.8 | 6.4-6.6 | 6.2-6.0 | 5.8-6.0 |
| 22 | 1 | What proteins in saliva prevent the precipitation of calcium phosphate salts and maintain them in a colloidal state? | Proline rich proteins of saliva | Lysozyme | Blood serum albumin | Blood serum globulins | Seromucoids |
| 23 | 1 | It is known that salivary glands produce several hormones. Which of them favours the mineralization of teeth? | Parotin | Calcitonin | Epidermal growth factor | Nerve growth factor | Thymocytes transforming factor |
| 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 | What ion component of saliva, whose concentration corresponds approximately to that in blood plasma, is the most important in mineralization of tooth tissues? | Calcium | Phosphate | Sulphate | Bicarbonate | Potassium |

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| 26 | 1 | What is the change of the mineralization of hard tissues of teeth in patients with salivary stone disease? | Altered proportion of mineral constituents of saliva occurs | Mineralization is decreased | Mineralization is increased | Mineralization does not change | - |
| 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 | Increase in content of what hormones in saliva characterizes the development of stress reaction in the organism? | Cortisol, adrenalin | Testosterone, estradiol | Parathyroid hormone, calcitonin | Thyroid hormones | Insulin |
| 29 | 1 | Which oral cavity enzymes, neutralizing free radicals, have important protective significance? | Myeloperoxidase and lactoperoxidase | Lysozyme and amylase | Proteinases and nucleases | Hyaluronidase and collagenase | Acid and alkaline phosphatases |
| 30 | 1 | In oral cavity initial stages of digestion occur. What enzyme of oral cavity breaks down polysaccharides? | Alpha-amylase | Maltase | Saccharase | Peroxidase | Catalase |
| 31 | 1 | Salivary alkaline phosphatase plays an important role in mineralization of a tooth enamel, providing the following process: | Increase of inorganic phosphate concentration in saliva | Decrease of calcium concentration in saliva | Decrease of inorganic phosphate concentration in saliva | Decrease of calcium and phosphate concentration in saliva | Decrease the resistance of enamel towards cariesogenic factors |
| 32 | 1 | In human saliva there is an enzyme able to hydrolyze the $\alpha[1\rightarrow4]$ glucosidic bonds in the molecule of starch. Name this enzyme: | α -Amylase | Phosphatase | Fructofuranosidase | β -Galactosidase | Lysozyme |
| 33 | 1 | For prevention of proteolysis of own proteins salivary glands produce inhibitors of proteinases. Note a proteinase inhibitor, produced in salivary glands. | Acid stable inhibitor of proteinases | Alpha-1-antitrypsin | Superoxide dismutase | Alpha-2-macroglobulin | Neuraminidase |

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| 34 | 1 | A child presents with hepatomegaly, hypoglycemia, and convulsions that occur predominantly during fasting or in stress inducing situations. The child is diagnosed with von Gierke disease (glycogen storage disease type I). What enzyme is affected by the genetic defect that is the cause of this disease? | Glucose-6-phosphatase | Phosphoglucomutase | Glycogen phosphorylase | Amylo-1,6-glycosidase | Hexokinase |
| 35 | 1 | During appointment with the dentist, a patient often develops anxiety, fear, and depression. These psychomotor changes occur due to the increased secretion of a certain mediator in the central nervous system. Name this mediator: | Serotonin | Dopamine | Acetylcholine | GABA | Histamine |
| 36 | 1 | Michaelis-Menten constants of two enzymes are 1.3×10^{-5} M/l and 2.3×10^{-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 | A child with signs of rickets has been prescribed a certain liposoluble vitamin drug by the paediatrician and dentist. This drug affects the metabolism of phosphorus and calcium in the body and facilitates calcium accumulation in bone tissue and dentin. If its content in the body is insufficient, a person develops disorders of ossification process, dental structure, and occlusion. Name this drug: | Ergocalciferol | Thyroidin | Retinolacetate | Tocopheroacetate | Philoquinone |

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| 38 | 1 | What type of immunoglobulins is prevailing in saliva and provides local immunity of mucous membranes in the oral cavity? | IgA | IgD | IgE | IgG | IgM |
| 39 | 1 | Daily produced amount of saliva depends from age, gender, nutrition etc. In majority of adults it corresponds to the next mean value: | 1,5-2,0 L | 1,0-1,5 L | 0,5-1,0 L | 0,3-0,7 L | 0,8-1,6 L |
| 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 | During a class in molecular biology, the mutations resulting in production of abnormal hemoglobins are being studied. What amino acid substitution occurs when S-hemoglobin is being produced, resulting in the development of sickle-cell anemia? | Glutamic acid is substituted with valine | Threonine is substituted with lysine | Glycine is substituted with asparagine | Glutamic acid is substituted with glycine | Valine is substituted with glutamic acid |

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| 44 | 1 | Mucine is a mixture of glycoproteins of mucinous type, secreted by different salivary glands. It performs the next function in oral cavity: | All answers are correct | It makes an envelope for mucous layer of oral cavity and teeth, thus protecting them from damage | Inhibits diffusion of ions into hard tissues of teeth | Binds calcium ions | Supports buffer properties of oral fluid |
| 45 | 1 | A 37-year-old woman presents with fructosemia and fructosuria. Her blood glucose is 2.1mmol/L. She is diagnosed with fructose intolerance. What congenital enzyme deficiency is the molecular basis of this diseases? | Fructose 1-phosphate aldolase | Phosphofruktokinase | Hexokinase | Trios-phosphate isomerase | Glucoisomerase |
| 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 | Salivary amylase hydrolyses α -1-4 glucosidic bonds in molecules of polysaccharides. What ion is necessary for stabilization of active centre structure in this enzyme? | Chloride | Magnesium | Calcium | Zinc | Selenium |

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| 48 | 1 | Saliva contains about 50 enzymes, including acid and alkaline phosphatases. What is the significance of phosphatases in physiology of oral cavity? | They release inorganic phosphate from phosphorus-containing organic substances and favour mineralization of bones and teeth. | They are an important protective factor against pathogenic gram-positive bacteria of oral cavity. | They change permeability of tissues, including tooth enamel. | They possess antioxidant function and protect oral mucosa | They inhibit proteolytic cleavage of salivary proteins. |
| 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 | Spectrophotometry | 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 |

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| 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 except 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. In which organ is the pathological process localized? | Heart | Liver | Kidneys | Stomach | Muscles |

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| 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 | Hyperbilirubinaemia | 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 cardiac specific 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 |

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| 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 | A diver that submerged to the depth of 75 meters detected signs of CNS functional disturbance: excitation, lapse of concentration, euphoria leading to professional errors. What substance has toxic effect on the neurons, thus leading to the development of these signs? | Nitrogen | Ammonia | Carbon dioxide | Oxygen | Lactate |
| 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 sulfanyl amides? | Competitive | Irreversible | Due to enzyme denaturation | Uncompetitive | Allosteric inhibition |
| 71 | 1 | A 35-year-old man has come to a dentist with complaints of decreased density of dental tissue and increased brittleness of his teeth during consumption of solid food. Laboratory analysis measured Ca/P correlation in the enamel sample. What value of Ca/P indicates increased demineralization? | 0.9 | 2.5 | 0.4 | 2.0 | 1.85 |

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| 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 | Saliva contains about 50 enzymes, including acid and alkaline phosphatases. What is the significance of phosphatases in physiology of oral cavity? | They release inorganic phosphate from phosphorus-containing organic substances and favour mineralization of bones and teeth. | They are an important protective factor against pathogenic gram-positive bacteria of oral cavity. | They change permeability of tissues, including tooth enamel. | They possess antioxidant function and protect oral mucosa | They inhibit proteolytic cleavage of salivary proteins. |
| 74 | 1 | Pharmaceuticals, containing mercury, arsen or other heavy metals, are inhibiting enzymes, possessing sulfhydryl groups. What amino acid is used for reactivation of these enzymes? | Cysteine | Histidine | Isoleucine | Aspartic acid | Glycine |
| 75 | 1 | In course of tuberculosis treatment 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 respiration (more then 5 min). What enzyme insufficiency may be responsible for this accident? | Acetylcholine esterase | Catalase | Glucose-6-phosphate dehydrogenase | Monoaminoxidase | Acetyl-transferase |

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| 77 | 1 | A patient with pulmonary tuberculosis prescribed is rifampicin that inhibits RNA-polymerase enzyme at the stage of initiation of the following process: | Transcription | Replication | Translation | Posttranscriptional modification | Posttranslational modification |
| 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 | Name salivary proteins, which possess antibacterial properties and participate in mineral metabolism: | All answers are correct | Acidic proteins, rich in proline | Statherins and lactoferrin | Cystatins | Histatins |
| 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 trypsin, 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 occur? | Heart | Liver | Skeletal muscles | Pancreas | Kidney |

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| 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 -glucosidase | 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 | Antioxidant enzymes of the saliva play an important protective role in decomposition of reactive oxygen. Find from the list one enzyme, which belongs to selenium-dependent enzymes. | Glutathione peroxidase | Superoxide dismutase | Catalase | Myeloperoxidase | Glucokinase |

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| 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 | A patient was diagnosed with a genetic disorder leading to lipoprotein lipase deficiency. What finding will be characteristic of biochemical blood analysis in this case? | Hypertriacylglycerolemia | Hypoglycemia | Hyperglycemia | Hypotriacylglycerolemia | ketonemia |
| 92 | 1 | A patient with megaloblastic anemia was taking a water-soluble vitamin. Name this substance: | Cyanocobalamin | Pyridoxine | Ascorbic acid | Folic acid | Retinol |
| 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 | Metabolites of TCA cycle play a range of functions in human body. Which of these metabolites found in saliva (standard 0.002 - 0.02 g /l), is involved in the regulation of blood calcium level and influences the mineralization of teeth? | Citrate | Isocitrate | Malate | Fumarate | α -ketoglutarate |
| 96 | 1 | Phosphororganic compound diisopropyl-fluorophosphate is a dangerous toxin as it inhibits cholinesterase. What is the mechanism of this inhibition? | Irreversible | Reversible | Competitive | Uncompetitive | Noncompetitive |

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| 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 ₃ M (iso 2) | H ₂ M ₂ (iso 3) | HM ₃ (iso 4) | M ₄ (iso 5) |
| 99 | 1 | In rickets the following 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 | Parathormone plays an important role in developing of tooth tissues. In which from the mentioned below glands is it synthesized? | In the salivary glands | In the thyroid gland | Spleen | In the pancreas | In the hypothalamus |
| 102 | 1 | Saliva contains proteins that play an important role in the oral cavity. What is normal total content of proteins in this liquid? | 2.0 - 5.0 g/l | 2.0 - 4.0 g/l | 0.15 - 0.25 g/l | 0.6 - 0.8 g/l | 1.0 - 3.25 g/l |
| 103 | 1 | Lab rats were used to study the effect of a certain vitamin on the body. Deficiency of this vitamin has resulted in a disturbed reproductive function and skeletal muscle dystrophy. What vitamin is it? | E | A | D | K | B2 |

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| 104 | 1 | A 25-year-old young man complains of general weakness, rapid fatigability, irritability, reduced working ability, and bleeding gums. What vitamin deficiency is the most likely cause of this condition? | Ascorbic acid | Folic acid | Retinol | Thiamine | Riboflavin |
| 105 | 1 | An ophthalmologist has detected increased time of darkness adaptation in the patient's eye. What vitamin deficiency can cause this sign? | A | E | D | K | F |
| 106 | 1 | Different forms of lympholeukoses are effectively cured with enzyme preparation called as: | Asparaginase | Plasmin | Tissue plasminogen activator (tPA) | Hyaluronidase | Streptokinase |
| 107 | 1 | Changes in chemical composition of saliva are observed not only in diseases of the oral cavity, but also in the digestive tract disorders. What somatic pathology is accompanied by decreased activity of lysozyme in saliva? | Stomach cancer | Hepatitis | Pancreatitis | Gastritis | Dysbacteriosis |
| 108 | 1 | What pathology can be suggested when the activity of amylase in saliva of a patient is decreased? | Insufficient secretory function of parotid glands | Sublingual gland hyperfunction | Submandibular gland hypofunction | Parotid gland hyperfunction | Sublingual gland hypofunction |
| 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 |

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| 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 | In the patient's blood there is a C-reactive protein that chemically can be classified as a glycoprotein. It indicates the following pathology: | Rheumatism | Porphyria | Anemia | Leucopenia | Thrombocytopenia |
| 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 drugs? | 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 |

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| 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 | Malotatate | Methanol | Allopurinol | Acetylsalicylic 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 were 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 derivative of 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 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 |
| 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 | Biochemical analysis of amino acid contents of freshly synthesized polypeptides shows that in the process of their translation the first amino acid in each of these proteins will be the same. Name this amino acid: | Methionine | Histidine | Serine | Isoleucine | Phenylalanine |

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| 125 | 1 | Formation of a large amount of immunoglobulins with various antigen specificity from a small number of genes occurs due to: | Recombination | Deletion | Transcription | Translocation | |
| 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 | The patient exhausted by starvation presents with intensification of the following process in the liver and kidneys: | Gluconeogenesis | Uric acid synthesis | Bilirubin synthesis | Urea synthesis | Hippuric acid synthesis |
| 128 | 1 | 30 minutes after the dental treatment the patient developed red itching spots on the face and oral mucosa. The patient was diagnosed with urticaria. What bioactive substance with vasodilating and pruriginous effect is produced during this type of allergic reaction? | Histamine | Bradykinin | Prostaglandin E2 | Interleukine 1 | Leukotriene B4 |
| 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 administered. Some time later he complains on general weakness, disorders of vision, coordination. Application of what vitamin may be useful for elimination of noted side effects? | Vitamin B6 | Vitamin A | Vitamin B2 | Vitamin C | Vitamin D |
| 131 | 1 | The patient's saliva has been tested for antibacterial activity. What saliva component has antibacterial properties? | Lysozyme | Cholesterol | Amylase | Parotine | Ceruloplasmine |

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| 132 | 1 | During laboratory diagnostics of hepatitis C, it is necessary to detect C virus in the patient's blood serum. What test should be conducted in this case? | Nucleic acid hybridization with signal amplification | Ligase chain reaction | Nucleic acid hybridisation | ELISA | DNA probe method |
| 133 | 1 | Many diseases are frequently accompanied by changes in content of different metabolites in saliva. What substance concentration may be increased in saliva of a patient suffering from diabetes mellitus? | Glucose | Creatinine | Urea | Albumin | Zinc ions |
| 134 | 1 | What component of saliva significantly increases the risk of caries development in case of diabetes mellitus? | Glucose | Amino acids | Urea | Residual nitrogen | Ammonia |
| 135 | 1 | Excessive content of glucose in saliva in persons with diabetes mellitus leads to development of the following pathology: | Multiple teeth lesions with tooth decay | Enamel hyperplasia | Enamel hypoplasia | Fluorosis | Increased calcification of enamel |
| 136 | 1 | A patient developed an intensive hypersalivation, which may cause partial neutralization of hydrochloric acid in gastric juice. Digestion of what substances will be altered in this case? | Proteins | Lipids | Nucleic acids | Cholesterides | Carbohydrates |
| 137 | 1 | A 6-year-old girl exhibits marked signs of hemolytic anemia. Biochemical analysis of her erythrocytes shows deficiency of glucose 6-phosphate dehydrogenase enzyme. What metabolic process is distributed in this patient and has leading role in the development of this pathology? | Pentose-phosphate pathway | Oxidative phosphorylation | Anaerobic glycolysis | Tissue respiration | Gluconeogenesis |

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| 138 | 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 B1 | Vitamin C | Vitamin B6 | Vitamin K | Vitamin PP |
| 139 | 1 | In case of enterobiasis acridine – the structural analogue of vitamin B2 - is administered. The synthesis disorder of which enzymes does this medicine cause in microorganisms? | FAD-dependent dehydrogenases | Cytochrome oxidases | Peptidases | NAD-dependent 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) | Pyridoxal phosphate | FMN (flavin mononucleotide) | 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 |

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| 145 | 1 | An experimental animal, a dog, received a weak solution of hydrochloric acid through a tube inserted into the duodenum. Primarily it will result in increased secretion of the following hormone: | Secretin | Cholecystokinin | Gastrin | Neurotensin | Histamine |
| 146 | 1 | A patient with chronic hepatitis undergoes blood test for serum protein fractions. Total protein levels are low, which indicates that in the hepatic cells the following organelles are functionally disturbed: | Granular endoplasmic reticulum | Golgi apparatus | Nucleus | Mitochondria | Lysosomes |
| 147 | 1 | Glucose synthesis from non-carbohydrates components is an important biochemical process. Gluconeogenesis from amino acids occurs most actively if a diet is rich in proteins. Which amino acid of those listed below is the most glycogenic? | Alanine | Valine | Lysine | Leucine | Isoleucine |
| 148 | 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 are the most likely to be caused by increased secretion of the following hormone: | Aldosterone | Oxytocin | Testosterone | Glucagon | Adrenaline |
| 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 | A 16-year-old girl, who has been starving herself for a long time to lose weight, developed an edema. This phenomenon is mainly caused by: | Hypoproteinemia due to protein synthesis disturbance | Decreased of glomerular filtration rate | Decreased production of vasopressin in the hypothalamus | Venous congestion and increased venous pressure | - |
| 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 |

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| 152 | 1 | During histologic examination of the skeletal muscle specimen. The investigator discovers an organelle that has 2 membranes: smooth outer membrane and internal. That forms multiple ridges of visible folds (cysts). Which of the following is the most likely function of this structure: | Synthesis and energy accumulation in the form of ATP | Synthesis of carbohydrates | Intracellular digestion of macromolecules | Formation of mitotic spindle | - |
| 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 administered. Some time later he complains on general weakness, disorders of vision, coordination. Application of what vitamin may be useful for elimination of noted side effects? | Vitamin B6 | Vitamin B2 | Vitamin C | Vitamin A | Vitamin D |
| 157 | 1 | In the experiment an investigator reveals that glucose is actively taken up by cells (except brain cells). Moreover, gluconeogenesis in liver is stimulated and glycogen synthesis in liver and muscles is increased. Which of the following hormones is most likely responsible for these changes? | Insulin | Glucagon | Aldosterone | Triiodothyronine | Somatostatin |

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| 158 | 1 | Somatic diseases usually are accompanied by changes in composition of saliva. What disease may cause the increase in residual nitrogen in saliva? | Renal insufficiency | Acute pancreatitis | Acute appendicitis | Infectious hepatitis | Perforation of gastric ulcer |
| 159 | 1 | During investigation of saliva of a patient with periodontitis an increase in products of free radical oxidation was revealed. What is the influence of excessive generation of these products upon tissues of oral cavity? | Damage of cells | Hyposalivation | Lowering of pH of saliva | Hypersalivation | Changes in chemical composition of saliva |
| 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 |

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| 162 | 1 | A 25-year old woman is admitted to the hospital because of a 6-week history of double vision and difficulty to talk after prolonged speaking. Her husband reports fluctuating droopy eyelids in the morning and evening. An immunologic assay detects the presence of circulating autoantibodies against the certain receptors at the neuromuscular junction. Affected binding of which of the following neurotransmitters is the most likely cause of this patient's symptoms? | Acetylcholine | Epinephrine | Dopamine | GABA | Serotonin |
| 163 | 1 | A 35-year-old woman is brought to the physician because of a 4-month history of progressive weakness of both lower limbs. She notes difficulty climbing stairs and complains of lethargy and loss of muscle bulk. Her diet consists primarily of "polished" rice. A diagnosis of dry beriberi is suspected. Deficiency of which of the following vitamins is most likely to be detected in her blood | Vitamin B1 | Vitamin B3 | Vitamin B12 | Vitamin C | Vitamin D |
| 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 |

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| 165 | 1 | A 40-year-old male comes to the physician because of recurrent painful flares and swelling of the metatarsal-phalangeal joint of the great toe. Laboratory study of urine sample shows extremely low pH and pink discoloration. Which of the following metabolic intermediates is the most likely cause of changes in the patient's urine? | Uric acid | Ammonia | Chloride | Nitrates | - |
| 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 | Pentose phosphate pathway |
| 167 | 1 | A 36-year-old male comes to the dental office for extraction of the tooth. Two weeks after the procedure is performed, the stratified squamous epithelium regenerates at the site of extraction. Which of the following organelles is most likely involved in the mucosa regeneration? | Ribosomes | Lysosomes | Mitochondria | Nucleus | Endoplasmic reticulum |
| 168 | 1 | Mitochondria are subcellular organelles and are present in a cytoplasm of every cell except 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 | Chronic overdosage of glucocorticoids leads to the development of hyperglycemia. What process of carbohydrate metabolism is responsible for this effect? | Gluconeogenesis | Glycogenolysis | Aerobic glycolysis | Pentose-phosphate cycle | Glycogenesis |

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| 170 | 1 | In a patient with paradontitis the increase in activity of acid phosphatase and hyaluronidase in saliva is observed. How these changes may be interpereted? | Acceleration of catabolism of biomolecules in parodont | Enhancement of proteins excretion with saliva | Disorder of hormonal regulation of metabolism in parodont | Activation of free radical processes | Insufficiency of protective function of parodont tissue |
| 171 | 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 |
| 172 | 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 |
| 173 | 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 |
| 174 | 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 aminottransferase | Lactate dehydrogenase |
| 175 | 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 |
| 176 | 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 |

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| 177 | 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 |
| 178 | 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 | Formylkynureninase (Arylformamidase) | Kynurenine 3-hydroxylase |
| 179 | 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 |
| 180 | 1 | In the complex treatment of periodontitis, tocopherol was used. What effect causes the healing properties of this vitamin? | Antioxidant | Antiphlogistic | Antialergic | Osteotropic | Prooxydant |
| 181 | 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 |
| 182 | 1 | In the process of metabolism human body produces active oxygen forms, including superoxide anion radical. This anion is inactivated by the following enzyme: | Superoxide dismutase | Catalase | Peroxidase | Glutathione peroxidase | Glutathione reductase |
| 183 | 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 |

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| 184 | 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 |
| 185 | 1 | During investigation of mixed saliva of the patient with parodontitis a dentist detected an increase in content of free amino acids. How this result can be interpreted? | Activation of proteolytic enzymes | Activation of nucleic acids degradation in tissues of parodont | Activation of free radical oxidation processes | Negative nitrogen balance | Insufficiency of water soluble vitamins |
| 186 | 1 | In a patient with erosive stomatitis enhanced concentration of chromium, nickel, cobalt, iron due to corrosion of prosthesis from chromo-nickel alloys was detected. The most probable cause of this state can be: | Shift of pH in saliva to acidic side | Hypersalivation | Shift pH in saliva to alkaline side | Poisoning with salts of heavy metals | Excessive content of fluorine in drinking water |
| 187 | 1 | In a patient a progressive demineralization of enamel is observed, pH of saliva is 6.0. What type of diet is recommended to be restricted? | Enriched in carbohydrates | Rich in lipids | Enriched in vitamins | Rich in proteins | Enriched in unsaturated fatty acids. |
| 188 | 1 | Caries develops as a consequence of the effect of many factors. What is the principal mechanism of multiple caries development in case of hyposalivation? | Decrease in mineralization capacity of saliva | Insufficiency of neuropeptides secretion | Decrease of hormones level | Insufficient mechanical processing of meal | Decrease in vitamins providement |
| 189 | 1 | Parodontitis is accompanied by activation of proteolytic degradation of parodont tissue. The marked increase in content of what substances in oral fluid indicates on activation of proteolysis? | Amino acids | Biogenic amines | Organic acids | Glucose | Cholesterol |

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| 190 | 1 | A patient suffers from diabetes mellitus with fasting hyperglycemia over 7.2 mmol/L. What blood plasma protein would allow to assess the patient's glycemia level retrospectively (4-8 weeks prior to examination)? | Glycated hemoglobin | Albumin | Fibrinogen | C-reactive protein | Ceruloplasmin |
| 191 | 1 | It is known that phosphoproteins (proteins with postranscriptional modification) are involved in the mineralization of bone and tooth. Phosphoric acid in these proteins is mainly associated with...: | Serine | Glycine | Methionine | Glutamate | GABA |
| 192 | 1 | The patient exhausted by starvation presents with intensification of the following process in the liver and kidneys: | Gluconeogenesis | Urea synthesis | Bilirubin synthesis | Hippuric acid synthesis | Uric acid synthesis |
| 193 | 1 | Enamel is highly resistant to various mechanical and chemical factors. Synthesis of what component provides the resistance? | Fluorapatite | Collagen | Carbonate apatite | Chlorine apatite | Hydroxyapatite |
| 192 | 1 | Mucin aggregates retain water, which results in their viscosity and protective action. It is possible because mucin structure contains: | Glycosaminoglycans | Homopolysaccharides | Disaccharides | Oligosaccharides | Glucose |
| 193 | 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 dehydration. The described changes were caused by the following type of acid-base imbalance: | Nongaseous excretory alkalosis | Gaseous alkalosis | Gaseous acidosis | Nongaseous metabolic acidosis | Nongaseous excretory acidosis |

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| 194 | 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 |
| 195 | 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 oxidase | Malate dehydrogenase | Heme synthase | Aspartate aminotransferase | Lactate dehydrogenase |
| 196 | 1 | The strength of tooth tissues depends on the ratio of organic, inorganic compounds and water. Which of the following tissues contain the least amount of water? | Enamel | Dentine | Periodontium | Pulp | Cement |
| 197 | 1 | A 13-year-old girl is an in-patient at the hematology department of the regional children's hospital. She has iron-deficiency anemia. What type of hypoxia does this patient have? | Hemic | Circulatory | Tissue | Respiratory | Mixed |
| 198 | 1 | Hydrogen peroxide is harmful and extremely toxic to living cells. Choose an enzyme which is used by cells for neutralization of hydrogen peroxide: | Glutathion peroxidase | Cytochrome oxidase | NADPH2-oxidase | Cyclooxygenase | Monoamine oxidase |
| 199 | 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 |
| 200 | 1 | CO is extremely dangerous poison as it irreversibly blocks respiratory 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 |

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| 201 | 1 | The production of thyroid hormones is stimulated under thyrotoxicosis. It leads to body weight 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 |
| 202 | 1 | Cyanides are extremely dangerous poisons as they irreversibly block respiratory chain of enzymes. At which point is arrested electron transport in presence of cyanides? | Cytochrome oxidase | NADH ₂ -ubiquinon reductase | Succinate dehydrogenase | Ubiquinon-cytochrome c reductase | Respiratory complex III enzymes |
| 203 | 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 |
| 204 | 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 |
| 205 | 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 | Methemoglobin reductase |

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| 206 | 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: | Thyroid hormones | Glucagone | Adrenaline | Insulin | Corticosteroids |
| 207 | 1 | A diabetes mellitus patient developed unconsciousness and convulsions after administration of insulin. What result of blood glucose analysis is the most likely in this case? | 1.5 mmol/L | 3 mmol/L | 3.8 mmol/L | 10 mmol/L | 5.5 mmol/L |
| 208 | 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 |
| 209 | 1 | Deposition of mineral salts occurs in the organic matrix of the tooth prior to the accelerated synthesis of one of the following polysaccharides: | Chondroitin sulfate | Heparin | Glycogen | Ceratan sulfate | Dermatan sulfate |
| 210 | 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 |
| 211 | 1 | In a patient are manifested symptoms of intoxication with arsenic compounds. What metabolic process is damaged taking into account that arsenic containing substances inactivate lipoic acid. | Oxidative decarboxylation of α -ketoglutarate. | Neutralization of superoxide anions | Coupling of oxidation and phosphorylation | Microsomal oxidation | Fatty acids biosynthesis |

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| 212 | 1 | Citrate is involved in the mobilization of calcium. What tooth tissue contains the highest concentration of citrate? | Dentine | Cement | Pulp | Enamel | Epithelium |
| 213 | 1 | An anaplerotic reaction which sustains the availability of oxaloacetate is the carboxylation of: | Pyruvate | Glutamate | Aconitate | Citrate | Succinate |
| 214 | 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 |
| 215 | 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 |
| 216 | 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 phosphorylation | Breaking up of peroxides |
| 217 | 1 | A patient with skin burns was delivered to a hospital. To clean the wound from necrotic tissues and mucus the doctor prescribed an enzymatic drug for topical treatment. Name this drug: | Tripsin | Pancreatin | Asparaginase | Streptokinase | Pepsin |
| 218 | 1 | Fluoride enters the human body mainly with water. What concentration of fluoride in water can predict the development of dental caries? | Up to 0.5 mg / l | Up to 1.0 mg / l | Up to 1.5 mg / l | Up to 2.0 mg / l | Up to 2.5 mg / l |

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| 219 | 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 |
| 220 | 1 | The combination of subunits in lactate dehydrogenase molecule makes it possible to create the next number of isoenzymes: | Five | Four | Six | Three | Eight |
| 221 | 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 | Pentose phosphate pathway |
| 222 | 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 |
| 223 | 1 | Anaerobic oxidation of glucose to lactate is regulated by appropriate enzymes. What enzyme is the major regulator of this process? | Phosphofruktokinase | Enolase | Glucose-6-phosphate isomerase | Lactate dehydrogenase | Aldolase |
| 224 | 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 |
| 225 | 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 |

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| 226 | 1 | Galactosemia- a genetic disorder, results in liver damage, cataract and severe mental retardation. Which enzyme deficiency takes place? | Galactose-1-phosphate uridylyltransferase | Galactokinase | Hexokinase | UDP-glucose-4-epimerase | pyruvate kinase |
| 227 | 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 |
| 228 | 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 |
| 229 | 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 |
| 230 | 1 | Fructosuria is known to be connected with inherited deficiency of fructose 1-phosphate 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 |
| 231 | 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 | Glycogenesis | Glycogenolysis |

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| 232 | 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 |
| 233 | 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 -Glutaminy transferase |
| 234 | 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 |
| 235 | 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 |
| 236 | 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 |
| 237 | 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 |

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| 238 | 1 | Organic matrix of enamel is represented by a variety of compounds, including proteins. Specific proteins of enamel include... | Amelogenin, ameloblastin, enamelin | Elastine | Collagen | Proteoglycans | Albumins |
| 239 | 1 | Formation of organic matrix is one of the stages of enamel mineralization. Name the protein that plays a leading role in this process. | Collagen | Fibronectin | Albumin | Globulin | Elastin |
| 240 | 1 | There are several pathways for glucose transformation and utilization, one of them is pentose phosphate pathway, which actively proceeds in liver, adrenal cortex, red blood cells. What is the main aim of this pathway? | NADPH ₂ generation and production of pentoses | Acetyl-CoA production | Synthesis of glycogen and fat | FADH ₂ generation | NADH ₂ and gluconic acid production |
| 241 | 1 | Mineral base of tooth tissue is formed with different apatite crystals. What type of apatite dominates in the mineral component of tooth tissue? | Hydroxyapatite | Fluorapatite | Carbonate apatite | Chlorine apatite | Strontium apatite |
| 242 | 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 |
| 243 | 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 |

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| 244 | 1 | Prolonged fasting causes hypoglycemia which is amplified by alcohol consumption, as the following process is inhibited: | Gluconeogenesis | Proteolysis | Glycolysis | Glycogenolysis | Lipolysis |
| 245 | 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 | Phosphoglucosutase | Amyloid-1,6-glycosidase | Glycogenphosphorylase | Glucokinase |
| 246 | 1 | The greatest quantity of the body glycogen can be found in which of the following human tissue? | Liver | Kidney | Skeletal muscles | Cardiac muscle | Brain |
| 247 | 1 | Due to trauma the patient's parathyroid glands have been removed, which resulted in inertness, thirst, sharp increase of neuromuscular excitability. Metabolism of the following substance is disturbed: | Calcium | Chlorine | Manganese | Molybdenum | Zinc |
| 248 | 1 | Glycogen polysaccharide is synthesized from the active form of glucose. The immediate donor of glucose residues during the glycogenesis: | UDP-glucose | Glucose-1-phosphate | ADP-glucose | Glucose-6-phosphate | Glucose-3-phosphate |
| 249 | 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 |

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| 250 | 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 |
| 251 | 1 | During biochemical investigation of blood in a patient was detected hypoglycemia in fasting condition. Investigation of liver biotates revealed the failure of glycogen synthesis. What enzyme deficiency may cause such status? | Glycogen synthase | Phosphorylase | Aldolase | Fructose bisphosphatase | Pyruvate carboxylase |
| 252 | 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 |
| 253 | 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 |
| 254 | 1 | In an infant with point mutations in genes the absence of glucose-6-phosphatase, hypoglycemia and hepatomegalia were revealed. To what disease are characteristic these symptoms? | Gierke disease | Adison disease | Parkinson disease | Cori disease | Mac Ardle disease |

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| 255 | 1 | In a weak apathic infant an enlarged liver was detected, which in investigation of biopsia 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 |
| 256 | 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 |
| 257 | 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 |
| 258 | 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 |
| 259 | 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 activity of the debranching enzyme | Liver glycogen phosphorylase | Muscle amylo-1,6-glucosidase activity of the debranching |
| 260 | 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 \rightarrow Oxaloacetate | Oxaloacetate \rightarrow glucose | Glucose \rightarrow pyruvate | Glucose \rightarrow ribose 5-phosphate | Lactate \rightarrow pyruvate |

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| 261 | 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 cardiomyopathy |
| 262 | 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 |
| 263 | 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 |
| 264 | 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 |
| 265 | 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 |

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| 266 | 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/l | 6.0-9.5 mM/l | 10.0-25.0 mM/l | 2.0-4.0 mM/l |
| 267 | 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 |
| 268 | 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 |
| 269 | 1 | A patient presents with high content of vasopressin (antidiuretic hormone) in the blood. What changes in the patient's diuresis will occur? | Oliguria | Polyuria | Anuria | Glycosuria | Natriuria |
| 270 | 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 |
| 271 | 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 |

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| 272 | 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 |
| 273 | 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 |
| 274 | 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 |
| 275 | 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 |
| 276 | 1 | A 58 years old woman, in a heavy state, cloudy consciousness, 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 |
| 277 | 1 | Destruction of pancreatic islets of Langerhans results in the decrease of production of: | Glucagon and insulin | Parathormone and cortisone | Thyroxyne and calcitonin | Insulin and adrenaline | Callicrein and angiotensin |

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| 278 | 1 | A 38-year-old man is receiving treatment for schizophrenia in hospital. The 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 | Dehydration of tissues | Hyperglycemia |
| 279 | 1 | Before the cells can utilize the glucose, it is first transported from the extracellular space through the plasma membrane inside them. This process is stimulated by the following hormone: | Insulin | Glucagon | Thyroxin | Aldosterone | Adrenalin |
| 280 | 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/l | 5.5 mM/l | 8.0 mM/l | 3.3 mM/l | 10.0 mM/l |
| 281 | 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 |
| 282 | 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 |

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| 283 | 1 | A 30-year-old woman complains of intense thirst and dryness of the mouth that developed after a severe emotional shock. Laboratory analysis revealed increase of the patient's blood sugar level up to 10 mmol/L. What endocrine gland is affected in the patient? | Pancreas | Thyroid gland | Gonads | Adrenal glands | Pineal gland |
| 284 | 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 |
| 285 | 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 |
| 286 | 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 mellitus | Myocardial infarction | Toxic hepatitis | Pancreatitis | Atherosclerosis |
| 287 | 1 | Cyclic AMP is formed from ATP by the enzyme adenylate cyclase which is activated by the hormone: | Epinephrine | Testosterone | Progesterone | Cortisol | Insulin |

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| 288 | 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 |
| 289 | 1 | A patient presents with osteoporosis; hypercalcemia and hypophosphatemia are observed in the patient's blood. What is the cause of this condition? | Increased parathormone secretion | Increased thyroxin secretion | Inhibited parathormone secretion | Increased corticosteroid secretion | Inhibited corticosteroid secretion |
| 290 | 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 |
| 291 | 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 |

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| 292 | 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 |
| 293 | 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 |
| 294 | 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 | Hypoproteinimiam | Hyperuricemia |

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| 295 | 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 |
| 296 | 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 |
| 297 | 1 | Obesity is a common disease. The aim of its treatment is to lower content of neutral fats in the body. What hormone sensitive enzyme is the most important for intracellular lipolysis? | Triacylglycerol lipase | Protein kinase | Adenylate kinase | Diacylglycerol lipase | Monoacylglycerol lipase |
| 298 | 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 |
| 299 | 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 |

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| 300 | 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 |
| 301 | 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 |
| 302 | 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 |
| 303 | 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 |
| 304 | 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 |

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| 305 | 1 | After intake of rich food a patient feels nausea and sluggishness; with time there appeared signs of steatorrhea. Blood cholesterol concentration is 9,2 micromole/l. This condition was caused by lack of: | Bile acids | Triglycerides | Fatty acids | Phospholipids | Chylomicrons |
| 306 | 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 |
| 307 | 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 |
| 308 | 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 |
| 309 | 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 |

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| 310 | 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 |
| 311 | 1 | The patient, who for a long time has been keeping to an unbalanced lowprotein diet, developed fatty liver infiltration. Name the substance, absence of which in the diet can lead to this condition: | Methionine | Alanine | Cholesterol | Arachidonic acid | Biotin |
| 312 | 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 |
| 313 | 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 |
| 314 | 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 |

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| 315 | 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 |
| 316 | 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 |
| 317 | 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 |
| 318 | 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 |
| 319 | 1 | Examination of a patient revealed erosion of enamel. What vitamin should be prescribed in this case? | D | K | C | A | PP |
| 320 | 1 | Vitamin A was prescribed to a patient with periodontitis. What process is activated under the influence of this vitamin and provides a therapeutic effect? | Growth and differentiation of cells | Hydroxylation of proline | Carboxylation of acids | Color vision | Antioxidant defense |
| 321 | 1 | Antioxidants of natural and artificial origin are used during the treatment of periodontal disease. Which of the following is used as antioxidant agent? | Taurine | Thiamine | Gluconate | Pyridoxine | Choline |
| 322 | 1 | Excess of fluoride in water leads to fluorosis. What element can be used for elimination of toxic effects of fluoride on the tooth? | Calcium | Potassium | Sodium | Mercury | Selenium |

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| 323 | 1 | Human body obtains vitamins, macro-and micronutrients from dietary uptake. Elevated quantities of what trace element has the most pronounced effect on the formation of caries? | Iron | Copper | Barium | Selenium | Strontium |
| 324 | 1 | Examination of a child revealed the initial stages of caries. Which products should dominate in the diet of the patient? | Protein, vitamins C, E A, minerals | Vegetable proteins, vitamins, minerals | Fats and fat-soluble vitamins | Carbohydrates and water soluble vitamins | Nucleic acids and micronutrients |
| 325 | 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 |
| 326 | 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, hydration, dehydrogenation, cleavage | Oxidation, dehydration, oxidation, cleavage | Reduction, dehydration, reduction, cleavage | Hydrogenation, dehydration, hydrogenation, cleavage | Reduction, hydration, dehydrogenation, cleavage |
| 327 | 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 | Enhancement of fatty acids biosynthesis in liver | Decrease of triacylglycerols in adipose tissue |
| 328 | 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 |
| 329 | 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 |

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| 330 | 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 |
| 331 | 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 |
| 332 | 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 Ca^{2+} in mitochondria | Substrate level of phosphorylation | Utilization of lactate | Synthesis of actin and myosin |
| 333 | 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 |
| 334 | 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 |
| 335 | 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 |

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| 336 | 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 |
| 337 | 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 |
| 338 | 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 |
| 339 | 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 |
| 340 | 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 |
| 341 | 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 |

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| 342 | 1 | Those organisms which in the process of evolution failed to develop protection from H ₂ O 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 |
| 343 | 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 |
| 344 | 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 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 |
| 345 | 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 |
| 345 | 1 | An experimental 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 |

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| 346 | 1 | A 58-year-old patient suffers from 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 |
| 347 | 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 |
| 348 | 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 |
| 349 | 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 |
| 350 | 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 | Glutathioneperoxidase | Glutathionereductase |

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| 351 | 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 H ₂ O ₂ | Inherited insufficiency of erythrocyte phosphatdehydrogenase | Shallow wound | Pus in the wound |
| 352 | 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 |
| 353 | 1 | Increase in blood of this class of lipoproteins is beneficial to ward off coronary heart disease: | LDL | HDL | VLDL | IDL | Chylomicrones |
| 354 | 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 |
| 355 | 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 |
| 356 | 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 |

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| 357 | 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 | Hyperlipoproteinemia type III | Hyperlipoproteinemia type IIb |
| 358 | 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 chylomicrons in blood. What enzyme activity decrease may cause this situation? | Lipoprotein lipase of blood | Pancreatic phospholipases | Lecithine cholesterol acyl transferase | Lipases of fat tissue | Pancreatic lipase |
| 359 | 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 | Monooleate glycerol | Phosphatidylserine |
| 360 | 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 |
| 361 | 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 |

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| 362 | 1 | A child 5 years old suffers from transient abdominal pains. Blood serum is turbid in fasting conditions. Cholesterol content – 4,3 mmol/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 |
| 363 | 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 |
| 364 | 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 |
| 365 | 1 | In a worker of chemical cleaning the fatty liver dystrophy was recognized. What substance biosynthesis disorder can lead to this pathology? | Phosphatidyl choline | Tristearylglycerol | Phosphatidic acid | Urea | Folic acid |
| 366 | 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 |
| 367 | 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 | Phospholipids |

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| 368 | 1 | Laboratory investigation of a patient revealed a high level of plasma LDL. What disease can be diagnosed? | Atherosclerosis | Nephropathy | Acute pancreatitis | Pneumonia | Gastritis |
| 369 | 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 |
| 370 | 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 | Monooleate glycerol | Lecithine |
| 371 | 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 reductase | Superoxide dismutase |
| 372 | 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 |
| 373 | 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 |

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| 373 | 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. | Entyrokinaase. | Amylase. | Pepsin. |
| 374 | 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 |
| 375 | 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 |
| 376 | 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 |
| 377 | 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 |

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| 378 | 1 | By the decarboxylation of glutamate in the CNS an inhibitory mediator is formed. Name it: | GABA | Glutathione | Histamine | Serotonin | Asparagine |
| 379 | 1 | A patient presents with dysfunction of cerebral cortex accompanied by epileptic seizures. He has been administered a biogenic amine synthesized from glutamate and responsible for central inhibition. What substance is it? | Gamma-amino butyric acid | Serotonin | Dopamine | Acetylcholine | Histamine |
| 380 | 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 |
| 381 | 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 |
| 382 | 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 |

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| 383 | 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 | Deamination |
| 384 | 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 |
| 385 | 1 | Examination of a patient suffering from 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 |
| 386 | 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 |
| 387 | 1 | A 9-month-old infant is fed with artificial formulas with unbalanced vitamin B6 concentration. The infant presents with pellagra dermatitis, convulsions, anaemia. Convulsion development might be caused by the disturbed formation of: | GABA | Histamine | Serotonin | DOPA | Dopamine |
| 388 | 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 |

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| 389 | 1 | In course of histidine catabolism a biogenic amin is formed that has powerful vasodilatating effect. Name it: | Histamine | Serotonin | Dioxyphenylalanine | Noradrenalin | Dopamine |
| 390 | 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 aminoacid. What biochemical mechanism underlies this process? | Decarboxylation | Desamination | Microsomal oxydation | Transamination | Formation of paired compounds |
| 391 | 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 |
| 392 | 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 |
| 393 | 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 |
| 394 | 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 |
| 395 | 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 |

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| 396 | 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 |
| 397 | 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 |
| 398 | 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 |
| 399 | 1 | After introduction of adrenaline the patient's blood glucose level increased. It is caused by intensified: | Glycogenolysis in the liver | Glycolysis in the liver | Glycolysis in the skeletal muscles | Glycogenolysis in the muscles | Glycogen synthesis |
| 400 | 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 |
| 401 | 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 |

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| 402 | 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 |
| 403 | 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 |
| 403 | 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 |
| 404 | 1 | In psychiatric practice, biogenic amines and their derivatives are 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 |
| 405 | 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 |
| 406 | 1 | In clinical practice for parenteral 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 |

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| 407 | 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 |
| 408 | 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 |
| 409 | 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 |
| 410 | 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 of ornithine cycle: | Carbamoyl phosphate | Citrulline | Ornithine | Urea | Argininosuccinate |
| 411 | 1 | After severe viral hepatitis a 4 year old boy presents with vomiting, 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 |

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| 412 | 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 |
| 413 | 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 |
| 414 | 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 |
| 415 | 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 |
| 416 | 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 hyperammonemia. Disturbance 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 amino acid decarboxylation | Inhibition of transamination enzyme |

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| 417 | 1 | After a serious viral infection a 3-year-old child has repeated vomiting, loss of consciousness, convulsions. Examination revealed hyperammonemia. 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 |
| 418 | 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 cerebrotoxic substances which accumulate in blood under hepar insufficiency? | Ammonia | IL-1 | Autoantibody | Necrosogenic substances | Ketone bodies |
| 419 | 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 |
| 420 | 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 |

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| 421 | 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 |
| 422 | 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 |
| 423 | 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 |
| 424 | 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 |
| 425 | 1 | Albinos can't stand sun impact – they don't acquire sun-tan but get sunburns. Disturbed metabolism of what amino acid underlies this phenomenon? | Phenylalanine | Methionine | Tryptophan | Glutamic acid | Histidine |
| 426 | 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 | Phosphofruktokinase | Phosphofruktomutase |
| 427 | 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 |

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| 428 | 1 | Oxidative decarboxylation of pyruvic acid is catalyzed by a multienzyme complex with several functionally linked coenzymes. Name this complex: | Thymidine diphosphate (TDP), flavin adenine dinucleotide (FAD), coenzyme A (CoASH), nicotine amide adenine dinucleotide (NAD), lipoic acid | Flavin adenine dinucleotide (FAD), tetrahydrofolate, pyridoxal-5-phosphate, thymidine diphosphate (TDP), choline | . Nicotine amide adenine dinucleotide (NAD), pyridoxal-5-phosphate, thymidine diphosphate (TDP), methylcobalamin, biotin | Coenzyme A (CoASH), flavin adenine dinucleotide (FAD), pyridoxal-5-phosphate, tetrahydrofolate acid, carnitine | Lipoic acid, tetrahydrofolate acid, pyridoxal-5-phosphate, methylcobalamin |
| 429 | 1 | It is known that in metabolism of catecholamine mediators the special role belongs to monoamine oxidase (MAO). How does this enzyme activate these mediators (noradrenaline, adrenaline, dopamine)? | Oxidative deamination | Amino group attachment | Methyl group removal | Carboxylation | Hydrolysis |
| 430 | 1 | A patient with acute pancreatitis presents with significantly increased urine diastase content. What proteolysis inhibitor must be included into complex therapy of this patient? | Contrykal (Aprotinin) | Festal | Pancreatine | Digestal | Mezym forte |
| 431 | 1 | Albinos become tanned poorly, instead they get sunburns. The disorder of what amino acid metabolism causes this phenomenon? | Tyrosine | Methionine | Tryptophan | Glutamine | Histidine |
| 432 | 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 |

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| 433 | 1 | Disorders of the enamel and dentin formation were observed due to a low content of calcium in the blood. What hormone deficiency may cause such disorders? | Parathyroid hormone | Somatotropin | Triiodothyronine | Insulin | Thyroxine |
| 434 | 1 | Plaque is a pathological formation on the surface of the teeth. The main sources of minerals in the formation of plaque are: | Gingival fluid | Oral liquid | Saliva | Blood plasma | Blood serum |
| 435 | 1 | Examination of a patient revealed plaque depositions. What compound is essential for plaque formation? | Calcium phosphate | Urate | Calcium oxalate | Pigments | Oxaloacetate |
| 436 | 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 |
| 437 | 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 |
| 438 | 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-cha α -keto acids | Glucose-6-phosphate dehydrogenase | Glycerol kinase | Aspartate aminotransferase | UDP-glucuronyltransferase |
| 439 | 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 |

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| 440 | 1 | 13 years old patient complains of general weakness, dizziness, fatigue. Besides this mental underdevelopment 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) |
| 441 | 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 |
| 442 | 1 | An infant shows the darkening of scleras, mucous membranes. The excreted urine darkens in tin air, homogentisic acid is determined both in the blood and urine. What is the diagnosis? | Alkaptonuria | Albinism | Cystinuria | Porphyria | Hemolytic anemia |
| 443 | 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 |
| 444 | 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 |

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| 445 | 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 |
| 446 | 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 | Absence of alanine aminotransferase activity in hepatocytes | Deficiency of ammonia for urea synthesis | Deficiency of CO ₂ for urea synthesis | Excess of ammonia blocking enzymes of urea synthesis |
| 447 | 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 |
| 448 | 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 |
| 449 | 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? | Homogentisate oxidase | Phenylalanine hydroxylase | Tyrosinase | Oxyphenyl pyruvate oxidase | Decarboxylase of phenylpyruvate |
| 450 | 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 |

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| 451 | 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 |
| 452 | 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 |
| 453 | 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 |
| 454 | 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 |
| 455 | 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 |

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| 456 | 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 |
| 457 | 1 | In a child with functional disorders of central nervous system during biochemical investigation were detected hyperammonemia. Preliminary diagnosis – hereditary hyperammonemia due to disorder of urea synthesis. What enzymopathia can cause this disease? | Ornithine transcarbamoylase | Gluthation transferase | Sulfotransferase | Glycyl transferase | Glucuronyl transferase |
| 458 | 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 |
| 459 | 1 | In humans, substances with osteotropic effects are synthesized. Which of the listed substances possess these properties? | Parotin | Nerve growth factor | Thyroxin | Insulin | Secretory immunoglobulin A |
| 460 | 1 | Hypovitaminosis of vitamin C reduces the formation of the organic matrix of teeth, delayed remineralization processes; leads to disturbance of collagen synthesis. This occurs, because this vitamin is involved in the process of... | Hydroxylation of proline and lysine | Carboxylation of proline | Carboxylation of lysine | Hydroxylation of proline | Hydroxylation of lysine |

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| 461 | 1 | In dental practice special pastes are used. They are rich in fat-soluble vitamins A and D, because: | These vitamins regulate metabolism of heteropolysaccharides of tooth and promote deposition of calcium salts | Promote replacement of strontium apatite by hydroxyapatite | These vitamins help the transformation of procollagen to collagen that results in remineralization | These vitamins activate energy metabolism in tissues of the tooth | Provides antioxidant properties of tissues |
| 462 | 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 |
| 463 | 1 | In experimental animals held 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 |
| 463 | 1 | Patients with erythropoietic porphyria (Gunther's disease) have teeth that fluoresce with bright red color 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-aminolevulinatase synthase | Uroporphyrinogen decarboxylase | Ferrochelatase |
| 464 | 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 |

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| 465 | 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 |
| 466 | 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 |
| 467 | 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 |
| 468 | 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 | Methemoglobin emia | Hepatic porphyria | Coproporphyrin | Intermittent porphyria |
| 469 | 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 | Coproporphyrin ogen III | Heme |

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| 470 | 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 |
| 471 | 1 | Orotic aciduria is a rare metabolic disorder characterized by the excretion of orotic acid in urine, severe anemia and retarded growth. It is due to the deficiency of the next enzyme... | Orotate phosphoribosyl transferase | Xanthine oxidase | HGPRT | Dihydroorotase | Carbamoyl phosphate synthetase II |
| 472 | 1 | The synthesis of purine and pyrimidine deoxyribonucleotides occurs from ribonucleotides 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 |
| 473 | 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 | Topoisomerase | RNA polymerase |
| 474 | 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 |

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| 475 | 1 | Among organic substances of a cell there is a polymer composed of dozens, hundreds, and thousands of monomers. This molecule is capable of self-reproduction and can be an information carrier. X-ray structure analysis shows this molecule to consist of two complementary spiral threads. Name this compound: | DNA | RNA | Carbohydrate | Cellulose | Hormone |
| 476 | 1 | Xeroderma pigmentosum (XP) is a rare autosomal recessive disease. The affected patients are photosensitive and susceptible to skin 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. |
| 477 | 1 | A 30-year-old breastfeeding woman keeps to the diet that daily provides her with 1000 mg of calcium, 1300 mg of phosphorus, and 20 mg of iron. How should the daily dosages of minerals in this diet be adjusted? | Increase phosphorus intake | Increase calcium intake | Decrease fluorine intake | Decrease iron intake | Increase iron intake |
| 478 | 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 |
| 479 | 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 | - |
| 480 | 1 | A particular codon always codes for the same amino acid. This feature of genetic code is known as... | Specificity | Universality | Non-overlapping | Degenerate | - |

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| 481 | 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 |
| 482 | 1 | Arachidonic acid as essential nutrient is needed for normal growth and development. It is precursor of biologically active substances. Indicate what compounds are synthesized from arachidonic acid | Prostaglandine E1 | Noradrenalin | Ethanolamine | Triiodothyronine | Choline |
| 483 | 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 | Ca ²⁺ |
| 484 | 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 |
| 485 | 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 |

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| 486 | 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 | Thyroglobulin |
| 487 | 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 | Iodine thyronines |
| 488 | 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 |
| 489 | 1 | During experiment the processes of food and water hydrolysis products absorption were studied. It was determined that these processes mainly occur in the following gastrointestinal segment: | Small intestine | Stomach | Large intestine | Rectum | Oral cavity |
| 490 | 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 |
| 491 | 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 |

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| 492 | 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 |
| 493 | 1 | A woman 47 years old complains for persistent feeling of thirst, rapid fatigue, loss of weight. Daily diuresis is 3-4 liters. 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 |
| 494 | 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 |
| 495 | 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 |
| 496 | 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 | Hyperproduction of corticosteroids |

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| 497 | 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 |
| 498 | 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 | Hyperproduction of corticosteroids |
| 499 | 1 | A patient complains of body weight loss, excessive irritability, insignificant increase of temperature, exophthalmia. 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 |
| 500 | 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 |
| 501 | 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 |

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| 502 | 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 |
| 503 | 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 F2 α | Prostaglandin D2 | Prostaglandin I2 |
| 504 | 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 |
| 505 | 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 |

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| 506 | 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 |
| 507 | 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 |
| 508 | 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 |
| 509 | 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 |
| 510 | 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 |

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| 511 | 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 |
| 512 | 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 | Increase of nitrogen-containing substances excretion. | Decrease of pyrimidine nucleotides reutilization. | Acceleration of nucleic acids biosynthesis |
| 513 | 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 |
| 514 | 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 |
| 515 | 1 | The decrease of uric acid concentration and the accumulation of xanthine and hypoxanthine 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 |
| 516 | 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 |

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| 517 | 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 |
| 518 | 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 | Ribonucleotide reductase | Methemoglobin reductase |
| 519 | 1 | Detoxification of bilirubin occurs in the membranes of endoplasmic reticulum of hepatocytes. Bilirubin is secreted by hepatocytes into bile for the most part as: | Bilirubin diglucuronide | Unconjugated bilirubin | Bilirubin monoglucuronide | Indirect reacting bilirubin | - |
| 520 | 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 |
| 521 | 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 |
| 522 | 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 |

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| 523 | 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 |
| 524 | 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 |
| 525 | 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 |
| 526 | 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 |

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| 527 | 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 ³² P, 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 |
| 528 | 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 hormone secretion disorder causes such physical development changes? | Somatotropic hormone | Adrenocorticotropic hormone | Thyroxin | Testosterone | Insulin |
| 529 | 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 |
| 530 | 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 |
| 531 | 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 |

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| 532 | 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 |
| 533 | 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 |
| 534 | 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 |
| 535 | 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 |
| 536 | 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 |
| 537 | 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 |
| 538 | 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 |

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| 539 | 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 |
| 540 | 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 |
| 541 | 1 | A therapist 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 |
| 542 | 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 |
| 543 | 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 |

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| 544 | 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 |
| 545 | 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 |
| 546 | 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 |
| 547 | 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 |
| 548 | 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 |

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| 549 | 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 |
| 550 | 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 |
| 551 | 1 | A 13 years old patient complains for general weakness, fatigue. Mental underdevelopment is 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 |
| 552 | 1 | A patient addressed to the physician with complaints for pain in small joints 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 |
| 553 | 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 |

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| 554 | 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 |
| 555 | 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 |
| 556 | 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 |
| 557 | 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 indican | Amino acids | Ammonia and poliamines | Glucose and glucosamine |
| 558 | 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 |

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| 559 | 1 | In 4 months child a “syndrome of blue clothes” is recognized, which is accompanied by periodical fever, enhanced excitability, growth retardation. Blood nitrogen is increased, in the urine an excess of animal indican is detected. What amino acid absorption is impaired? | Tryptophan | Thyrosine | Phenylalanine | Lysine | Histidine |
| 560 | 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 |
| 561 | 1 | Breakdown of cyclic adenosine monophosphate (cAMP) and cyclic guanosine monophosphate (cGMP) into simple, non-cyclic nucleoside monophosphates is catalyzed by the following enzyme: | Phosphodiesterase | Glycogen phosphorylase | Glucose 6-phosphatase | Adenylate cyclase | Protein kinase |
| 562 | 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 vasodilating effect |
| 563 | 1 | A 20-year-old patient complains of morbid thirst and hyperdiuresis (up to 10 l daily). Glucose concentration in blood is normal but it is absent in urine. The patient has been diagnosed with diabetes insipidus. What hormonal drug is the most appropriate for management of this disorder? | Vasopressin | Cortisol | Thyroxin | Oxytocin | Insulin |

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| 564 | 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 |
| 565 | 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 |
| 566 | 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 |
| 567 | 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 |
| 568 | 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 |
| 569 | 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 |

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| 570 | 1 | After a person 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 |
| 571 | 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 |
| 572 | 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 |
| 573 | 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 | Ferrochelataze |

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| 574 | 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 bilirubin | Stercobilin | Bilirubin glucuronides |
| 575 | 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 |
| 576 | 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 |
| 577 | 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 |
| 578 | 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 |
| 579 | 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 |

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| 580 | 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 |
| 581 | 1 | A patient at the early stage of diabetes mellitus was found to have polyuria. What is its cause? | Hyperglycemia | Ketonemia | Hypocholesterolemia | Hypercholesterolemia | Hyperkaliemia |
| 582 | 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 |
| 583 | 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 |
| 584 | 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 |
| 585 | 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 |
| 586 | 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 |

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| 587 | 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 |
| 588 | 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 |
| 589 | 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 |
| 590 | 1 | Drugs that block certain channels can prevent the transmission of excitation from presynaptic membrane to the postsynaptic membrane of synapse. What channels are blocked? | Calcium | Sodium | Potassium potential-dependent | Potassium ATP-dependent | Chlorine |
| 591 | 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 |
| 592 | 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 |

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| 593 | 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 |
| 594 | 1 | Hormonal form of a certain vitamin induces genome level synthesis of Ca-binding proteins and enterocytes thus regulating the intestinal absorption of Ca ²⁺ ions required for dental tissue development. What vitamin is it? | D3 | K | A | E | B1 |
| 595 | 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 |
| 596 | 1 | 30 minutes after dental treatment the patient developed red itching spots on the face and oral mucosa. The patient was diagnosed with urticaria. What bioactive substance with vasodilating and pruriginous effect is produced during this type of allergic reaction? | Histamine | Prostaglandin E2 | Interleukin-1 | Leukotriene B4 | Bradykinin |
| 597 | 1 | A patient with megaloblastic anemia was taking a water-soluble vitamin. Name this substance: | Cyanocobalamin | Thiamine chloride | Tocopherol acetate | Ascorbic acid | Pyridoxine |
| 598 | 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 |

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| 599 | 1 | The asymmetry 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 |
| 600 | 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 |
| 601 | 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 globulin content |
| 602 | 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 | Aminolevulinat esynthase | Heme oxygenase | Heme synthetase | Biliverdine reductase |
| 603 | 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 |
| 604 | 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 |

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| 605 | 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 |
| 606 | 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 |
| 607 | 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 |
| 608 | 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 |
| 609 | 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 | Hyperbilirubine mia | Bilirubinuria | Cholemia | Urobilinuria |
| 610 | 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 |

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| 611 | 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 |
| 612 | 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 bilirubin | Dehydrobilirubin | Hydrobilirubin | Choleglobin |
| 613 | 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 |
| 614 | 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 bilirubin | Stercobilin | Bilirubin glucuronides |
| 615 | 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 |

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| 616 | 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 |
| 617 | 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 |
| 618 | 1 | A 20-year-old woman came to the doctor with complaints of general weight loss, loss of appetite, weakness, skin discoloration resembling bronze tan. In addition to hyperpigmentation, examination in the hospital revealed bilateral adrenal tuberculosis. What substance leads to skin hyperpigmentation, when accumulated excessively? | Melanin | Bilirubin | Hemozoin | Lipofuscin | Adrenochrome |
| 619 | 1 | During cell analysis, their cytoplasm was determined to have high content of aminoacyl tRNA synthetase. This enzyme ensures the following process: | Amino acid activation | Repair | Elongation | Transcription | Replication |
| 620 | 1 | An experimental 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 |

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| 621 | 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 |
| 622 | 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 |
| 623 | 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 |
| 624 | 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 |
| 625 | 1 | What enzyme has demineralization effect, i. e. intensifies decomposition of mineral components of the tooth tissues? | Acid phosphatase | Alkaline phosphatase | Glucose 6-phosphatase | Glycogen phosphorylase | Phosphotransferase |
| 626 | 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 |

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| 627 | 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 |
| 628 | 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 |
| 629 | 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 |
| 630 | 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 |
| 631 | 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 glycogen 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-phosphatutidine transferase |
| 632 | 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 | Aminolevulinat synthase | Heme oxygenase | Biliverdin reductase |

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| 633 | 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) |
| 634 | 1 | In a patient was recognized congenital liver disease, which is accompanied with high bilirubinemia due to increase in free (nonconjugated) bilirubin. In liver biopsy was detected trace activity of glucuronyl transferase. What disease can be recognized? | Crigler-Najjar syndrome | Gilbert syndrome | Physiological jaundice | Dubin-Johnson syndrome | Wilson disease |
| 635 | 1 | After a serious viral infection a 3-year-old child has repeated vomiting, loss of consciousness, convulsions. Examination revealed hyperammonemia. 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 putrefaction of proteins in intestines | Inhibited activity of transamination enzymes |
| 636 | 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 |
| 637 | 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 |
| 638 | 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 |

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| 639 | 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 |
| 640 | 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 |
| 641 | 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 |
| 642 | 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 | Gluconeogenesis from amino acids |
| 643 | 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 |

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| 644 | 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 |
| 645 | 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 |
| 646 | 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 |
| 647 | 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 |
| 648 | 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 |
| 649 | 1 | Coenzym A participates in numerous important metabolic reactions. It is a derivative of the following vitamin: | Pantothenic acid | Thiamine | Niacin | Calciferol | Ubiquinone |
| 650 | 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 |

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| 651 | 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 |
| 652 | 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 |
| 653 | 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 |
| 654 | 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 |
| 655 | 1 | Erythrocytes of the patient with hemolytic anemia present with significant decrease of pyruvate kinase activity. What methabolic process is disturbed in this case? | Glycolysis | Glycogenolysis | Pentose-phosphate pathway of glucose oxidation | Glycogen synthesis | Gluconeogenesis |
| 656 | 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 |

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| 657 | 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 |
| 658 | 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 |
| 659 | 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 |
| 660 | 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 |
| 661 | 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 |

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| 662 | 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 |
| 663 | 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 |
| 664 | 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 |
| 665 | 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 |
| 666 | 1 | Vitamin A together with specific cytoceptors 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 |

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| 667 | 1 | To prevent postoperative bleeding a 6-year-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 |
| 668 | 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 |
| 669 | 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 |
| 670 | 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 |
| 671 | 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 |
| 672 | 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 |

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| 673 | 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 |
| 674 | 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 |
| 675 | 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 Ca^{2+} rate in mitochondria | Substrate-linked phosphorylation | Utilization of lactic acid | Oxidative phosphorylation |
| 676 | 1 | Biotin as a cofactor participates in the next metabolic reactions: | Incorporation of CO_2 into molecules of metabolites (carboxylation) | Decarboxylation of pyruvate | Oxidation of fatty acids | Transfer of phosphate groups (kinase reaction) | Production of H_2O_2 (oxidase reaction) |
| 677 | 1 | In an ill child the enlargement of abdomen, curvature of lower limbs, skull enlargement, general weakness is observed. What nutrient insufficiency can lead to development of such manifestations? | Vitamin D | Vitamin C | Carbohydrates | Lipids | Iron |
| 678 | 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 | Tocopherol |

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| 679 | 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 |
| 680 | 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 |
| 681 | 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 |
| 682 | 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 |
| 683 | 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 |
| 684 | 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 |

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| 685 | 1 | To determine functional state of the patient's liver, the analysis of animal indican excreted with urine was conducted. This substance is produced in the process of detoxification of putrefaction products of a certain amino acid, which takes place in the large intestine. Name this amino acid: | Tryptophan | Valine | Serine | Glycine | Cysteine |
| 686 | 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 |
| 687 | 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 |
| 688 | 1 | A 16-year-old girl, who has been starving herself for a long time to lose weight, developed an edema. This phenomenon is mainly caused by: | Hypoproteinemia due to protein synthesis disturbance | Hypoglycemia due to glycogen synthesis disturbance | Venous congestion and increased venous pressure | Deceleration of glomerular filtration rate | Decreased production of vasopressin in the hypothalamus |
| 689 | 1 | A 28-year-old patient complains of frequent gingival hemorrhages. Blood test revealed the clotting factor II (prothrombin) deficiency. What phase of blood coagulation is impaired in this patient? | Thrombin generation | Vascular-platelet haemostasis | Clot retraction | Fibrinolysis | - |

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| 690 | 1 | Beriberi is a classical example of thiamine deficiency. Active form of this vitamin is synthesized by an enzyme belonging to the following group: | Transferases | Oxidoreductases | Hydrolases | Lyases | Isomerase |
| 692 | 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 -Tocopherol | Vitamin A | Glucose | Fatty acids | Glycerol |
| 693 | 1 | Deficiency of ergocalciferol causes development of the next disease: | Rickets | Pernicious anemia | Pellagra | Scurvy | Xerophthalmia |
| 694 | 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 |
| 695 | 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 insufficiency of the next vitamin: | B12 | B2 | B5 | C | D |
| 696 | 1 | A patient complains for loss of appetite, 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 |

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| 697 | 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 |
| 698 | 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 |
| 699 | 1 | A 60-year-old woman with hepatocirrhosis developed hemorrhagic syndrome. What mechanism leads to the development of this condition? | Decreased synthesis of prothrombin and fibrinogen | Increased portal venous pressure | Deceased blood oncotic pressure | Reduction of hepatic glycogen stores | . Emergence of neurotoxins in the blood |
| 700 | 1 | Blood serum of the patient has milky appearance. Biochemical analysis revealed high content of triacylglycerols and chylomicrons. This condition is caused by hereditary defect of the following enzyme: | Lipoprotein lipase | Phospholipase C | Pancreatic lipase | Adipose tissue hormone-sensitive lipase | Phosphodiesterase |
| 701 | 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 |
| 702 | 1 | Chromatin contains positively charged histone proteins. What amino acid is contained in histone proteins in large amounts? | Lysine | Alanine | Valine | Threonine | Serine |
| 703 | 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 |

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| 704 | 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 |
| 705 | 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 |
| 706 | 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 |
| 707 | 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 |
| 708 | 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 loss of enzymatic activity. What is this amino acid residue? | Serine | Tyrosine | Threonine | Aspartate | Methionine |
| 708 | 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 |

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| 709 | 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 |
| 710 | | 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 |
| 711 | 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 |
| 712 | 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 |
| 713 | 1 | Dopamine precursor - dioxyphenylalanine (DOPA) - is used in treatment of Parkinson's disease. This active substance is produced from the following amino acid: | Tyrosine | Alanine | Cysteine | Histidine | Tryptophan |
| 714 | 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 |
| 715 | 1 | A patient has a critical impairment of protein, 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 |

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| 716 | 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 |
| 717 | 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 |
| 718 | 1 | To prevent attacks of acute pancreatitis a doctor prescribed the patient trasyolol (contrycal, gordox), which is an inhibitor of: | Trypsin | Elastase | Carboxypeptidase | Chymotrypsin | Gastricsin |
| 719 | 1 | A hospital has admitted 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 |
| 720 | 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 |
| 721 | 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 |

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| 722 | 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 |
| 723 | 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 |
| 724 | 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 |
| 725 | 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 |
| 726 | 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 |
| 727 | 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 |

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| 728 | 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 |
| 729 | 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 |
| 730 | 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 |
| 731 | 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 |
| 732 | 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 |
| 733 | 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 |

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| 734 | 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 |
| 735 | 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 |
| 736 | 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 |
| 737 | 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 |
| 738 | 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 |

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| 739 | 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 |
| 740 | 1 | Note substance, which activates pepsinogen to pepsin: | Hydrochloric acid | Enterokinase | Trypsin | Bile acids | Adenosine triphosphate |
| 741 | 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 |
| 742 | 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 exocrine 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 |
| 743 | 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 |
| 744 | 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 |

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| 745 | 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 |
| 746 | 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: | 6-year-old child | 74-old woman | 33-old men after trauma | Consuming a diet deficient in lysine | A normal, healthy adult |
| 747 | 1 | What substance is produced from tryptophan in case of protein putrefaction in digestive tube? | Indole | Putrescine | Cresol | Phenol | Serotonine |
| 748 | 1 | The level of protein putrefaction in bowels can be evaluated by determination of the next compound in urine: | Indicane | Scatole | Indole | Indoxyle | Scatoxyle |
| 749 | 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 |
| 750 | 1 | In duodenum the digestion of carbohydrates occurs due to action of pancreatic enzymes. What enzymes from listed below can hydrolyse α 1-4 glycosidic bonds? | α -amylase | Lipase | Carboxypeptidase | Trypsin | Elastase |
| 751 | 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 |

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| 752 | 1 | In dietary deficiency or insufficient production of endogenous 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 |
| 753 | 1 | Selenium is an ultra trace element and is incorporated in structure of enzyme: | Gluthation peroxidase | Lactate dehydrogenase | Catalase | Myeloperoxidase | Pyruvate kinase |
| 754 | 1 | An 84-year-old patient suffers from parkinsonism. One of the pathogenetic development elements of this disease is deficiency of a certain mediator in some of the brain structures. Name this mediator: | Dopamine | Adrenaline | Histamine | Noradrenaline | Acetylcholine |
| 755 | 1 | A 50-year-old man came to a hospital with complaints of memory disorders, painful sensations along the nerve trunks, decreased mental ability, circulatory disorders and dyspepsia. Anamnesis states excessive alcohol consumption. What vitamin deficiency can result in such symptoms? | Thiamine | Niacin | Retinol | Calciferol | Riboflavin |
| 756 | 1 | In digestion of dietary lipids there is need in one of the digestive secrets. What secret from listed below take part in lipids emulsification? | Bile | Intestinal juice | Pancreatic juice | Saliva | Gastric juice |
| 757 | 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 |

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| 758 | 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 |
| 759 | 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 |
| 760 | 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 |
| 761 | 1 | A dentist with the aim of plague prophylaxis administered a 2 year child a medication, containing: | F | I | Br | Fe | Mn |
| 762 | 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 |
| 763 | 1 | During ultrasound a patient with atherosclerosis was diagnosed with bilateral stenosis of the renal arteries. Specify the bioactive substance that is the key pathogenetic link in the development of arterial hypertension in this case: | Renin | Adrenaline | Vasopressin | Cortisol | Thyroxin |

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| 764 | 1 | In the piece of gastric mucosa, excised from patient with gastric ulcer disease, <i>Helicobacter pylori</i> was detected. What enzyme can be detected simultaneously in the tissue specimen? | Urease | Dehydrogenase | Alanine AT | Aspartate AT | Carboxypeptidase |
| 765 | 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 |
| 766 | 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 |
| 767 | 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, gastrin | Lipase, phospholipase |
| 768 | 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 | - |
| 769 | 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 |

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| 770 | 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 |
| 771 | 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 |
| 772 | 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 |
| 773 | 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. |
| 774 | 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 | α I –inhibitor of proteinases | Antithromboplas tine | Anticonvertin |
| 775 | 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 | - |

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| 776 | 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 | - |
| 777 | 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 | - |
| 778 | 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 |
| 779 | 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 |
| 780 | 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 |
| 781 | 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 |
| 782 | 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 |

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| 783 | 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 |
| 784 | 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 |
| 785 | 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 |
| 876 | 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 |
| 787 | 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 |
| 788 | 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 | Antithromboplas tin | Anticonvertin |

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| 789 | 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 |
| 790 | 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 |
| 791 | 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 |
| 792 | 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 |
| 793 | 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 |
| 794 | 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 |
| 795 | 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 |

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| 796 | 1 | After a traffic accident a man presents with severe blood loss, consciousness disturbance, low blood pressure, as well as compensatory activation of the reninangiotensin system, which results in: | Hyperproduction of aldosterone | Increased blood coagulation | Intensification of erythropoiesis | Hyperproduction of vasopressin | Intensification of heart contractions |
| 797 | 1 | Laboratory analysis revealed UDP glucuronyl transferase deficiency in the patient. What blood values can confirm this enzymopathy? | Hyperbilirubinemia | Indicanuria | Phenylketonuria | Ketoacidosis | Uremia |
| 798 | 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 |
| 799 | 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 |
| 800 | 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 |
| 801 | 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 |

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| 802 | 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 |
| 803 | 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 |
| 804 | 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 |
| 805 | 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 |
| 806 | 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 |

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| 806 | 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 |
| 807 | 1 | In long-term rhythmic muscular work ATP in muscles is synthesized by means of oxidation of: | Lipids | Lactate | Glucose | Glycogen | Aminoacids |
| 808 | 1 | The contraction of the smooth muscles when the calcium concentration increases up to $10\mu\text{m}$ 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 |
| 809 | 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 |
| 810 | 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 |

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| 811 | 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 Ca ²⁺ level in mitochondrias | Substrate phosphorylation | Lactate utilization | Actin and myosin synthesis |
| 812 | 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 |
| 813 | 1 | Osteolaterism is characterized 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 |
| 814 | 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 asparagine | δ -aminopropionics |

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| 815 | 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 |
| 816 | 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 |
| 817 | 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 |
| 818 | 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 |
| 819 | 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 |
| 820 | 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 |

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| 821 | 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 |
| 822 | 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 |
| 823 | 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 |
| 824 | 1 | A 36 year old female patient has a history of collagen disease. Urine analysis likely to reveal an increased concentration of the following metabolite: | Oxyproline | Indican | Creatinine | Urea | Urobilinogen |
| 825 | 1 | Mineralization of tooth tissue is regulated by many hormones. What hormone of salivary glands contributes to this process? | Parotin | Calcitonin | Kalidin | Thyroxine | Parathyroid hormone |
| 826 | 1 | Osteocalcin plays the main role in the process of calcification of tooth tissues. This protein has the ability to bind calcium ions. Indicate special amino acid that provides this function. | Carboxyglutamine | Alanine | Oxyproline | Proline | - |