

**List of questions for testing in the discipline "Clinical Biochemistry"  
for students entering 2023, according to the educational program  
31.05.01 General medicine,  
(specialty), full-time form of education  
2024-2025 academic year .**

No.	List of questions for testing
1.	Basic laboratory research methods. The main tasks of using laboratory examination. Structure and equipment of modern laboratories.
2.	The concept of quality control of laboratory research. Quality criteria. Diagnostic specificity and sensitivity of the test.
3.	Features of intra-laboratory and inter-laboratory quality control in the Volgograd region.
4.	Types of biological material and collection conditions for clinical laboratory research.
5.	Features of blood collection for biochemical studies. Methods for obtaining plasma and serum, types of anticoagulants.
6.	Features of urine collection for laboratory tests: general urine analysis, Zimnitsky, Nechiporenko, Reberg test, 24-hour urine collection, two-glass sample.
7.	Basic SI units in biochemistry. Average indicators and reference values.
8.	Basic statistical criteria in quality control of laboratory research.
9.	Types of laboratory tests. Screening, preventive and differential diagnostic studies. Express diagnostics.
10.	Analytical, technical and economic, diagnostic value of biochemical methods. Standardization of research.
11.	Liver functions and methods for their assessment. Reference values of laboratory parameters of liver function typical for the population of the Volgograd region.
12.	Clinical and biochemical syndromes in liver diseases. Laboratory diagnostic criteria.
13.	Enzymatic diagnosis of liver diseases. Hyper- and hypoenzymemia.
14.	The importance of alanine and aspartate aminotransferases, lactate dehydrogenase, $\gamma$ -glutamyl transpeptidase, alkaline phosphatase, glutamate dehydrogenase, sorbitol dehydrogenase in the diagnosis of liver diseases.
15.	Jaundice, concept, types, characteristics, differential diagnosis. Hyperbilirubinemia and bilirubinuria.
16.	Metabolism of bilirubin. Free (indirect) and conjugated (direct) bilirubin, urobilinogen and stercobilinogen, bile pigments.
17.	Bilirubin toxicity. Jaundice of newborns (physiological and hemolytic, jaundice of prematurity, non-hemolytic hyperbilirubinemia of newborns).
18.	Determination of the concentration of total, free and bound bilirubin. Reference values of bilirubin indicators in the blood, urine and feces of residents of the Volgograd region.
19.	Protein composition of blood plasma. Functions of blood proteins.
20.	Total protein in blood serum, hypo- and hyperproteinemia.
21.	Characteristics of methods for studying blood proteins, their advantages and disadvantages.
22.	Albumin, hyper- and hypoalbuminemia. Characteristics of globulins. Hyper- and hypoglobulinemia.
23.	Characteristics of proteins of the acute phase of inflammation.
24.	Proteinograms for various diseases (acute and chronic inflammation, hepatitis, malignant tumors, renal filter disorders, etc.).
25.	Pancreas, structure, functions. Insulin, effect on metabolism Assessment of pancreatic function. Determination of $\alpha$ -amylase, lipase, trypsin activity.
26.	Concept and forms of pancreatitis. Laboratory tests for acute and chronic pancreatitis.

27.	Diabetes mellitus, definition, classification. Diagnostic criteria for diabetes mellitus types I and II. Hyperglycemia and glycosuria.
28.	Diagnostic criteria for diabetes mellitus types I and II. Main symptoms and clinical manifestations.
29.	Glucose content in whole blood and plasma, difference . Hyperglycemia and glycosuria.
30.	Impaired glucose tolerance, concept, diagnostic criteria for evaluating the glucose tolerance test. Impaired fasting glucose. Postprandial hyperglycemia.
31.	Methods for determining blood glucose levels.
32.	Early laboratory diagnosis of diabetes mellitus.
33.	Criteria for compensation of diabetes mellitus. Effective control of hyperglycemia: determination of glycosylated hemoglobin, fructosamine.
34.	Glycosylated hemoglobin, fructosamine, concept.
35.	Metabolic syndrome, concept, characteristics. Lipid spectrum indicators in diabetes mellitus.
36.	Hypoglycemic coma, causes.
37.	Classification and functions of lipids. Atherogenic and antiatherogenic lipoproteins.
38.	Atherosclerosis, definition, factors and stages of development.
39.	Lipid metabolism disorders. Dislipoproteinemia. Hyperlipoproteinemia.
40.	Diagnostic value of cholesterol and its fractions in blood lipoproteins.
41.	Study of lipid metabolism. Friedwald formula.
42.	Determination of the main indicators of atherosclerosis : total cholesterol, $\alpha$ -cholesterol (HDL), atherogenic index Recommended and borderline values of total cholesterol, moderate and severe hypercholesterolemia.
43.	Recommended and borderline values of total cholesterol, moderate and severe hypercholesterolemia.
44.	Stages of diagnosing lipid metabolism disorders.
45.	Coronary heart disease, concept, risk factors, causes of development.
46.	Enzymatic diagnosis of myocardial infarction.
47.	Modern requirements for a marker of myocardial necrosis.
48.	Myocardial infarction, definition, diagnostic criteria. Markers of acute myocardial infarction.
49.	Laboratory diagnosis of angina pectoris, hypertension.
50.	Laboratory diagnosis of myocarditis, cardiomyopathies.
51.	Kidney functions. Functional unit of the kidney. Filtration, reabsorption, clearance, renal threshold.
52.	General urine analysis. Organized and unorganized urine sediment. Reference values of biochemical parameters of urine of residents of the Volgograd region.
53.	Physiological components of urine: urea, creatinine, creatine, uric acid. Methods for their determination.
54.	Biochemical analysis of urine in the diagnosis of kidney diseases. Clearance, transport maximum, renal threshold, functional indicators of kidney function. Diuresis and its disorders: polyuria, oliguria, anuria, nocturia.
55.	Pathological components of urine: glucosuria, proteinuria and its types. Methods for their determination.
56.	Clinical and laboratory syndromes of kidney damage. Characteristic.
57.	Distribution of water in the body. Intracellular fluid. Extracellular fluid. Fluid spaces
58.	Assessment of the positive and negative water balance of the body. Edema. Mechanisms of edema development in cardiovascular failure and kidney diseases.
59.	Methods for assessing water balance.
60.	Osmotic and oncotic pressure. Determination of osmolality.

61.	Types of water-electrolyte balance disorders. Reasons. Characteristic. Laboratory diagnostic criteria.
62.	Regulation of sodium and water exchange. Types of sodium metabolism disorders. Hyponatremia. Hypernatremia.
63.	The role of potassium ions in the human body. Hyper- and hypokalemia, clinical manifestations. Calcium, hyper- and hypocalcemia in children and adults. Reference values of potassium and calcium ions in the blood of residents of the Volgograd region.
64.	Hyper- and hypokalemia, clinical manifestations, diagnostics.
65.	Calcium metabolism. Regulation of calcium metabolism. Hyper- and hypocalcemia in children and adults.
66.	The role of phosphorus ions in the human body, acid-soluble and acid-insoluble fractions. Hyper- and hypophosphatemia in children and adults.
67.	Methods for determining mineral metabolism indicators.
68.	Acid-base balance of the body, concept, characteristics. Blood buffer systems.
69.	The role of physiological systems in maintaining acid-base balance.
70.	Forms of acid-base imbalance (alkalosis and acidosis: respiratory, metabolic, compensated, decompensated). Characteristic. Laboratory indicators.
71.	Clinical and diagnostic significance of changes in acid-base status.
72.	General clinical tests, express diagnostics of emergency conditions in anesthesiology and resuscitation.

Considered at a meeting of the Department of Clinical Laboratory Diagnostics  
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