ДОКУМЕНТ ПОДПИСАН
ЭЛЕКТРОННОЙ ПОДПИСЬЮ

Сведения о сертификате ЭП

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ФГБОУ ВО Университет биотехнологий

Кафедра Ветеринарной генетики и биотехнологии

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УТВЕРЖДЕН
на заседании кафедры
Протокол от «14 » 01 20 26 г. № 5
И.о Заведующего кафедрой
_____ М.В. Стрижкова
(подпись)

ФОНД ОЦЕНОЧНЫХ СРЕДСТВ

ФТД.В.02 Essential of biochemistry

36.05.01 Ветеринария (уровень специалитета)

виды деятельности: **врачебная, экспертно-контрольная; научно-образовательная**

Новосибирск 2026

Паспорт

фонда оценочных средств

№ п/п	Контролируемые разделы (темы) дисциплины*	Код контролируемой компетенции (или ее части)	Наименование оценочного средства
1	Introduction Brief history, subject and tasks of biological chemistry	УК4, ОПК1	Вопросы для коллоквиума, контрольная работа
2	Substances Proteins	УК4, ОПК1	Вопросы для коллоквиума, контрольная работа
3	Lipids and Carbohydrates	УК4, ОПК1	Вопросы для коллоквиума, контрольная работа
4	Vitamins	УК4, ОПК1	Вопросы для коллоквиума, контрольная работа
5	Enzymes	УК4, ОПК1	Вопросы для коллоквиума, контрольная работа
6	Hormones	УК4, ОПК1	Вопросы для коллоквиума, контрольная работа
7	Metabolism Substance&energy metabolism in organism	УК4, ОПК1	Вопросы для коллоквиума, контрольная работа
8	Protein metabolism	УК4, ОПК1	*Вопросы к зачету*

ТЕКУЩИЙ КОНТРОЛЬ УСПЕВАЕМОСТИ

1.Описание оценочных средств по разделам (темам) дисциплины

Раздел 1. Introduction

Brief history, subject and tasks of biological chemistry

Вопросы для коллоквиума:

1.Give the definition of biochemistry.

2.Sections of modern biochemistry.

3.What breaks up sections of modern biochemistry depending on the object or direction of research?

4.The domestic history of development of biochemistry.

5.The most important biochemical centers.

6.Methods of biochemistry.

Раздел 2.Substances Proteins

Вопросы для коллоквиума:

1.Physico-chemical properties of proteins.

2.Biological properties of proteins.

3.Methods for the isolation and purification of proteins.

4.The protein levels of the organization.

5.Simple proteins, their classification and characteristics.

6.Complex proteins, their classification and characteristics.

Раздел 3.Lipids and Carbohydrates

Вопросы для коллоквиума:

1.General characteristics of lipids and their classification.

2.Biological significance of lipids and their role in animal feeding.

3.Name the major classes of lipids and their representatives?

4.What are the main components of phosphoglycerides and describe their biological role.

5.Describe the chemical structure and basic properties of triglycerides. What is their biological role?

6.Describe the chemical structure and main properties of steroids. What is their biological role?

Раздел 4.Vitamins

Вопросы для коллоквиума:

1.Vitamins, soluble in fats, chemical structure, biological role.

2.Vitamins A.

3.Vitamins of group D.

4.Vitamins E.

5.B vitamins K.

6.Vitamin Q.

7.Vitamin F.

8.Vitamins, water soluble, chemical structure, biological role.

9.Vitamin B1.

10.Vitamin B2.

11.Vitamin B3.

12.Vitamin B5.

13.Vitamin B6.

14.The Vitamin B12.
15.Vitamin B15.
16.Vitamin BC.
17.Vitamin C.
18.Vitamins of group R.
19.Vitamin H.
20.Vitamin-like substances.
21.The concept of antivitamins.

Раздел 5.Enzymes

Вопросы для коллоквиума:

1.The factors determining the catalytic activity of enzymes.
2.The concept of activation energy.
3.The value of Michaelis constant.
4.The dependence of the rate of the enzymatic reaction on the concentration of the substrate.
5.Inhibitors of enzymes.
6.Competitive inhibition.
7.Non-competitive inhibition.
8.Multienzyme complexes.
9.Classification and nomenclature of enzymes.
10.The development of Enzymology and enzyme industry.
11.The use of enzyme preparations in agriculture.

Раздел 6.Hormones

Вопросы для коллоквиума:

1. The concept of endocrine glands.
2.List the main endocrine glands.
3.The main endocrine system of the body and their functional relationships.
4.The connection between endocrine glands and target organs.
5.The thyroid hormones.
6.Hormones of the hypothalamus.
7.Hormones of the pituitary gland.
8.The adrenal hormones.
9.Hormones of the pancreas.
10.Sex hormones.
11.Hypo - and hyperfunction of the endocrine glands.
12.The use of hormones and their synthetic analogues in animal husbandry.

Раздел 7.Metabolism

Substance&energy metabolism in organism

Вопросы для коллоквиума:

1.What are the main stages of metabolism.
2.Give a description of catabolism, anabolism and metabolism.
3.Biological oxidation and tissue respiration.
4.The difference between oxidative phosphorylation from oxidation.

Раздел 8.Protein metabolism

Вопросы для коллоквиума:

1.Biological role of proteins.
2.Proteins and proteids.
3.Balance of nitrogen and its types.
4.Splitting of proteins in the digestion system. Peptides.

5.Features of transformation of nitrigen containing substances in ruminants. Microbial protein synthesis in ruminant prestomachs, cecum and colonic. Importance of proteins microbial synthesis in ruminants nutrition.

6.Complete (higher-quality) and incomplete (lower quality) proteins. Absorption of products of proteins digestion.

7.Decaying of proteins in the intestine when exposed to bacteria and the mechanism to neutralize toxic products.

8.Biosynthesis of proteins and its basic stages.

9.Pathways of amino acids transformation (deamination, transamination, decarboxylation). Biosynthesis of amino acids in an organism.

10.Ammonia neutralisation in an organism (urea synthesis, glutamine, asparagine, etc.)

11.Features of amino acids metabolism. Use of nitrogen free residues of amino acids in tissues.

12.General principles of regulation of proteins metabolism.

13.Principles to ration protein and amino acids food for animals.

14.Features of proteins metabolism in poultry.

15.Pathologies of protein metabolism.

16.Features of chromoproteins metabolism and other composite proteins.

Критерии оценки вопросов для коллоквиума:

«Зачтено» – ставится в том случае, когда студент обнаруживает знание программного материала по дисциплине, допускает несущественные погрешности в ответе. Ответ самостоятелен, логически выстроен. Основные понятия употреблены правильно.

«Незачтено» – ставится в том случае, когда студент демонстрирует пробелы в знаниях основного учебного материала по дисциплине, обнаруживает непонимание основного содержания теоретического материала или допускает ряд существенных ошибок и не может их исправить при наводящих вопросах преподавателя, затрудняется в ответах на вопросы. Ответ носит поверхностный характер; наблюдаются неточности в использовании научной терминологии.

Критерии оценки результатов тестирования:

– оценка «отлично» выставляется студенту, если процент правильных ответов составляет 80-100%;

– оценка «хорошо» – 70-79%;

– оценка «удовлетворительно» – 60-69%;

– оценка «неудовлетворительно» – менее 60%.

ПРОМЕЖУТОЧНАЯ АТТЕСТАЦИЯ

Вопросы к зачету

1. Physical properties of water and ice.
2. Types of water.
3. Water activity and food spoilage.
4. The hydrogen indicator.
5. The subject of biological chemistry and relationship to other scientific areas.
6. History of biochemistry and the contribution of home scientists to its development.
7. Problems and prospects of biochemistry development.
8. Definition and biological role of proteins in life phenomena.
9. The structure of amino acids.
10. Animal and plant proteins.
11. Levels of proteins structure.
12. Physical and chemical properties of proteins.
13. Classification of proteins.

14.Concept of nucleic acids, history of their discovery.
15. The structure of nucleotides.
16.The structure of nucleic acids.
17.Nucleoproteins.
18.General characteristic of carbohydrates.
19. The structure of carbohydrates.
20.Classification of carbohydrates (monosaccharides, oligosaccharide and polysaccharides).
21.Properties of carbohydrates.
22..General characteristic of lipids.
23.Classification of lipids.
24.Properties and lipids structure.
25. Essential fatty acids and coronary heart disease.
26.Reactions of unsaturated fatty acids.
27.The chemical nature and general properties of enzymes.
28.The mechanism of enzymes action.
29.Inhibitors and activators of enzymes.
30.Isoenzymes.
31.Methods of allocation and purification of enzymes.
32.The nomenclature and classification of enzymes.
33.Common views about oxidation-reduction processes in a cell and in food industry.
34.Development prospects in enzymology and fermental industry. Immobilized enzymes.
35.Application of fermental preparations in national economy.
36. History of development of the doctrine about vitamins.
37.General characteristic, classification and nomenclature of vitamins.
38.Concept about avitaminosis, hypo-and hypervitaminosis.
39.Vitamins of group A.
40.Vitamins of group D.
41.Vitamins of group E.
42.Group K vitamins.
43.Vitamin F.
44.Vitamin B1.
45.Vitamin B2.
46. Vitamin B3 (pantotenic acid).
47.Vitamin B5 (nicotinic acid).
48.Vitamin B6.
49.Vitamine B_9 (folium acid).
50.Vitamin B12.
51.Vitamine C.
52.Para amino benzoic acid.
53.Vitamin P.
54.Biotin.
55.Principles of vitamin nutrition formation for animals.
56.Antivitamins.
57.Vitamins as food ingredients.
58.General characteristic of hormones.
59.Pituitary hormones.
60.Thyroid gland hormones.
61.Pancreas hormones.
62.Hormones of sexual glands.
63. Use of hormones and their synthetic analogues in animal industries.

Критерии оценки вопросов для коллоквиума:

«Зачтено» – ставится в том случае, когда студент обнаруживает знание программного материала по дисциплине, допускает несущественные погрешности в ответе. Ответ самостоятелен, логически выстроен. Основные понятия употреблены правильно.

«Незачтено» – ставится в том случае, когда студент демонстрирует пробелы в знаниях основного учебного материала по дисциплине, обнаруживает непонимание основного содержания теоретического материала или допускает ряд существенных ошибок и не может их исправить при наводящих вопросах преподавателя, затрудняется в ответах на вопросы. Ответ носит поверхностный характер; наблюдаются неточности в использовании научной терминологии.

ЗАДАНИЯ
ДЛЯ ОЦЕНКИ УРОВНЯ СФОРМИРОВАННОСТИ КОМПЕТЕНЦИИ

Задания для оценки сформированности компетенции «УК-4»

Задания закрытого типа:

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:

A. ADP-ribosilation.
B. Methylation.
C. Adenylation.
D. Restricted proteolysis.
*E. Phosphorylation-dephosphorylation.
Ответ:E

2. Some hours after an intensive physical training a sportsman showed activated gluconeogenesis. Which of the following is the basic substrate of gluconeogenesis? A. Serine.
B. Aspartate.
C. Glutamate.
D. a-Ketoglutarate. *E. Lactate.
Ответ:E

3. The concentration of glucose in the blood plasma of a healthy man varies within the following limits: A. 2.0-4.0 mM/L.
*B. 3.3-5.5 mM/L.
C.10.0-25.0 mM/L.
D.6.0-9.5 mM/L.
E. 1.0-2.0 mM/L.
Ответ:B

4. The high speed sprint causes a feeling of pain in skeletal muscles of untrained people that occurs due to lactate accumulation. The activation of what biochemical process is it resulting from? A. Gluconeogenesis. *B. Glycolysis.
C. Pentose phosphate pathway.
D. Lipogenesis.
E. Glycogenesis.
Ответ:B

5.Protein avidin, a minor constituent of uncooked eggs, is a powerful specific inhibitor of biotin enzymes. Which of the below listed metabolic

transformations would be blocked in case of the avidin addition to the cells homogenate?

A. Glucose -> ribose 5-phosphate.

B. Glucose -> pyruvate. C. Glucose → fructose

*D. Pyruvate -> oxaloacetate. E.

Lactate -> pyruvate.

Ответ:D

6.What biochemical process is stimulated in the liver and kidneys of a patient exhausted by starvation? A. Synthesis of bilirubin.

B. Synthesis of urea.

*C. Gluconeogenesis.

D.Formation of hippuric acid.

E. Synthesis of uric acid.

Ответ:C

7. Erythrocytes require energy of ATP for their vital functions. What process provides these cells with the necessary amount of ATP?

*A. Anaerobic glycolysis.

B. Aerobic oxidation of glucose.

C. Pentose phosphate pathway. D. -Oxidation of fatty acids. β

E. Citric acid cycle.

Ответ:A

8. Due to the lack of thiamine (vitamin BI) vitamin deficiency a disease called "beri-beri" develops and carbohydrate metabolism becomes disturbed. What metabolite accumulates in blood under beri-beri?

A. Lactate.

*B. Pyruvate. C.

Succinate.

D. Citrate.

E. Malate.

Ответ:B

9. Anaerobic oxidation of glucose to lactate is regulated by appropriate enzymes. What enzyme is the main regulator of this process ?-

A. Lactate- dehydrogenase B.

Glucose-6-phosphate isomerase.

C. Aldolase.

D. Enolase.

*E. Phosphofructokinase.

Ответ:E

1**0. 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?**

A. Diabetes mellitus.

*B. Galactosemia.

C. Lactosemia.

D. Steroid diabetes.

E. Fructosemia.

Ответ:B

11.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 du ring this process enter blood

circulation and arc transported as the components of:

A. LDL.
B. Globulins.
C. HDL.
*D. Serum albumins. E.
Chylomicrons.
Ответ:D

12.Laboratory investigation of a patient revealed a high level of plasma LDL. What disease can be diagnosed? A.
Gastritis.
B. Nephropathy.
C. Acute pancreatitis. *D.Atherosclerosis. E. Pneumonia.
Ответ:D

13.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?

A. Pepsin.
B. Phospholipase.
C. Enterokinase.
D.Amylase.
*E. Pancreatic lipase.
Ответ:E

14.The collagen molecule is known to contain such amino acids as hydroxyproline and hydroxylysine. Which of the following substances take part in the hydroxylation of proline and lysine during the synthesis?

A. Aspartic acid.
B. Folic acid.
C. Pantothenic acid.
D. Glutamic acid.
*E. Ascorbic acid.
Ответ:E

15.Albinos suffer badly from the influence of ultraviolet light - they get sunburnt because of spending too much time in the sun. Metabolism disturbance of what amino acid is the reason for this phenomenon? A. Tryptophan.
B. Methionine .
*C. Phenylalanine. D.
Glutamate.
E. Histidine.
Ответ:C

16.Destruction of protein and polysaccharide components of connective tissue occurs in case of parodontal disease. Which of the following proteins does connective tissue include?

*A. Collagen. B.
Albumin.
C. Transferrin.
D. Ceruloplasmin.
E. Antitrypsin.
Ответ:A

17. There is a peptide in a human body in which the formation of the y-carboxylic group of glutamate takes part. What is this peptide called?

A. Vasopressin.
B. Carnosine.
C. Anserine.
D.Oxytocin.
*E. Glutathione.
Ответ:E

18.Hemoglobin of an adult person is a tetramer consisting of two identical ,- α and two identical -polypeptide chains. What is this kind of the protein structure β called?

A. Primary.
B. Secondary.
C. Tertiary.
*D. Quaternary. E.
Peptide.
Ответ:D

19.An unusually active amine, a mediator of inflammation and allergy, appears via decarboxylation of histidine. Which of the following is it? A. Serotonin.
*B. Histamine. C.
Dopamine. D. -
Aminobutyrate. γ
E. Tryptamine.
Ответ:B

20.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? A. Arginine.
*B. Melanin.
C. Methionine.
D. Phenylalanine.
E. Thyroxin.
Ответ:B

Задания открытого типа:

1. All proteins consist from……..
Ответ:amino acids.

2.The primary structure of peptides and proteins refers to the…….. number and order of the amino acids present.
Ответ: linear

3.The disruption and loss of native conformation of protein is called ……..; it is accompanied by loss of biologic activity.
Ответ:denaturation

4.Quaternary structure describes the …… composition of a functional protein.
Ответ:subunit

5. Metabolism of glucose molecule to pyruvate or lactate for production of energy called
……..
Ответ:glycolysis

6. Hyperglycemia is an …… in plasma glucose levels.
Ответ: increase

7. Acts on thyroid follicle cells to stimulate throid hormone synthesis. It is ……

Ответ: thyroid-stimulating hormone, TSH

8. This hormone regulation of overall body weight by limiting food intake and increasingenergy expenditure, regulation of the neuroendocrine axis, inflammatory responses, blood pressure, and bone mass. It called……

Ответ:leptin

9.Vitamin …… is actually a family of tocopherols known as alpha, beta, gamma and delta (a, b, c, d in the ancient Greek alphabet, just in case you were curious).

Ответ: E

10. …… is the entire network of chemical reactions carried out by living cells.

Ответ: Metabolism

Задания для оценки сформированности компетенции «ОПК-1»

Задания закрытого типа:

1.Because of prolonged starvation, the tissue carbohydrate stores are quickly exhausted and hypoglycemia ensues in a human body. Which of the following metabolic pathways can restore the level of glucose in blood?

A. Aerobic glycolysis.

B. Anaerobic glycolysis.*C. Gluconeogenesis. D. Glycogenolysis.

E. Pentose phosphate pathway.

Ответ:C

2.Under diabetes mellitus, the level of ketone bodies in blood dramatically rises, which results in the development of metabolic acidosis. What substance is the precursor of the ketone bodies synthesis?

A. Methylmalonyl-CoA.

B. Succinyl -CoA.

C. Propionyl-CoA.

D. Malonyl-CoA.*E. Acetyl-CoA.

Ответ:E

3.Skeletal muscle pain during physical work is a characteristic sign of glycogenosis. The inherited deficiency of what enzyme does this pathology result from?

*A. Glycogen phosphorylase.

B. Glucose-6-phosphatase.

C. Glycogen synthetase.

D. Amylo-1.6-glicosidase.

E. Lysosomal glycosidase.

Ответ:A

4.The essence of lipolysis, that is the mobilization of fatty acids from neutral fats depots, is an enzymatic process of hydrolysis of triacylglycerols tofatty acids and glycerol. Fatty acids that release du ring this process enter blood circulation and arc transported as the components of:

A. LDL.

B. Globulins.

C. HDL.

*D. Serum albumins.

E. Chylomicrons.

Ответ:D

5.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.

A. Phospholipids.

B. Fatty acids.

C. Chylomicrons.

D. Triacylglycerols.* E. Bile acids.

Ответ:E

6. Aerobic oxidation of substrates is typical of a cardiac muscle. Which of the following is the major oxidation substrate of a cardiac muscle?

*A. Fatty acids.

B. Triacylglycerols.

C. Glycerol.

D. Glucose.

E. Amino acids.

Ответ:A

7.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?

*A. Transport of fatty acids into mitochondria.

B. Ketone bodies synthesis.

C. Lipids synthesis.

D. Tissue respiration.

E. Steroid hormones synthesis.

Ответ:A

8.Clinical signs and laboratory testing of a patient allow to make the assumption of gallbladder inflammation, colloid properties of bile disorder, the occurrence of gall-stones. Which substances can underlie the formation of gall-stones? A. Oxalates.

B. Urates.

*C. Cholesterol.

D. Chlorides.

E. Phosphates.

Ответ:C

9.Arachidonic acid, an essential component of a human diet, acts as a precursor of the vitally important physiologically active biomolecules. Which substances are synthesized from arachidonic acid?

A. Ethanolamine.

B. Choline.

C. Noradrenaline.*D. Prostaglandin E 1 E. Triiodothyronine.

Ответ:D

10.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. A. HDL.

*B. Chylomicrons.

C. LDL.D. Cholesterol.

E. Phospholipids.

Ответ:B

11. 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? A. Pepsin.

B. Phospholipase.

C. Enterokinase.

D.Amylase.

*E. Pancreatic lipase.

Ответ:E

12.What substance renders viscous and slimy properties to saliva, performs protective function and counteracts the mechanical damages of the oral cavity mucous membrane? A. Lysozyme.

B. Glucose.

C. Kallikrein.

D. Amylase.*E. Mucin.

Ответ:E

13.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. A. Dopamine.

B. Histamine.

C. Serotonin.

*D.GABA.

E. Taurine.

Ответ:D

14.Wilson's disease, so-called hepato cerebral degeneration, is manifested by the lowered blood ceruloplasmin level. Insufficiency of this transport protein leads to: A. Decarboxylation of amino acids.

B. Degradation of tissue albumins.

*C. Formation of complexes of amino acids with copper.

D. Synthesis of urea.

E. Transamination of amino acids.

Ответ:C

15.Ammonia is a very poisonous chemical, especially for the nervous system. What substance takes a particularly active part in the detoxication of ammonia in the brain tissue? A. Lysine .

*B. Glutamic acid.

C. Proline.

D. Histidine.

E. Alanine.

Ответ:B

16. 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 princi pal pathway for biogenic amines production in body tissues?

*A. Decarboxylation of amino acids.

B. Deamination of amino acids.

D. Transamination of amino acids.

C. Oxidation of amino acids.

D. Reductive amination.

Ответ:A

17. Krebs cycle plays an essential role in the real ization of gl uconeogcnic effect of certain amino acids. It is caused by the obligatory transformation of their anazotic carbon skeletons into: A. Malate.

*B. Oxaloacetate.

C. Succinate.

D. Fumarate.

E. Citrate

Ответ:B

18.An unusually active amine, a mediator of inflammation and allergy, appears via decarboxylation of histidine. Which of the following is it? A. Serotonin.

*B. Histamine. C.

Dopamine. D. -

Aminobutyrate.γ

E. Tryptamine. Ответ:B

19. Vitamin therapy is appointed to a pregnant with a few involuntary abortions in namnesis. What vitamin contributes to the bearing of pregnancy?

A. Rutin.

B. Folic acid.

C. Cobalamine.

D. Pyridoxine.

* E. a-Tocopherol.

Ответ:E

20.A patient suffers from dermatitis, diarrhea and dementia. The absence of which vitamin is the cause of such clinical state? A. Folic acid.

B. Ascorbic acid.

*C. Nicotinamide.

D. Biotin.

E. Rutin.

Ответ:C

Задания открытого типа:

1. The main carbohydrate in milk is a …….called lactose.

Ответ: disaccharide

2. The lack of…….. in the human or animal organism can cause disease "megaloblasticanemia?

Ответ: Cobalamine (B_{12})

3. The lactic acidosis is an indirect effect of an increase in ……...due to increasedglycolisis.

Ответ: pyruvate

4. For general chemistry analytes? Such as glucose or phosphorus, …….is themost widelyused technique.

Ответ: spectrophotometry

5. For electrolytes, such as sodium and potassium, ……. electrodes are extensively used and have largely replaced flame photometers.

Ответ: ion-specific

6. Lipoprotein electrophoresis has been largely replaced by direct measurement of highdencity lipoprotein (HDL) cholesterol and calculation of …… lipoprotein (LDL) cholesterol.

Ответ: low- dencity

7. Two-dimensional …….enables the separation of complex mixtures and in animportant tool for the discovery of new biomarkers for disease (proteomics).

Ответ: electrophoresis

8. The most widely used method for measuring totalserum proteinlevel is the …….. reaction, in whichcupric ions complex with two or more peptide bonds.

Ответ: biuret

9.The body maintains acid-base balance though various ……..systems.

Ответ: buffering

10.Atomic absorption spectrophotometry is still used for …….

Ответ:metals.

МАТРИЦА СООТВЕТСТВИЯ КРИТЕРИЕВ ОЦЕНКИ УРОВНЮ СФОРМИРОВАННОСТИ КОМПЕТЕНЦИЙ

Критерии оценки	Уровень сформированности компетенций
Оценка по пятибалльной системе	
«Отлично»	*«Высокий уровень»*
«Хорошо»	*«Повышенный уровень»*
«Удовлетворительно»	*«Пороговый уровень»*
«Неудовлетворительно»	*«Не достаточный»*
Оценка по системе «зачет – незачет»	
«Зачтено»	*«Достаточный»*
«Не зачтено»	*«Не достаточный»*

Методические материалы, определяющие процедуру оценивания знаний, умений, навыков и (или) опыта деятельности, характеризующих этапы формирования компетенций

1. Положение «О балльно-рейтинговой системе аттестации студентов»: СМК ПНД 08-01-2026 (https://edubiotech.ru/sveden/document/lokalnye-akty/?ysclid=mnfnl4uzus606249516: режим доступа свободный);

2. Положение «О проведении текущего контроля и промежуточной аттестации обучающихся ФГБОУ ВО Университет биотехнологий»: СМК ПНД 77-01-2026 (https://edubiotech.ru/sveden/document/lokalnye-akty/?ysclid=mnfnl4uzus606249516: режим доступа свободный).

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(подпись)