

Документ подписан простой электронной подписью

Информация о владельце:

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Дата подписания: 20.10.2026 10:11:25

Уникальный программный ключ:

bbc0243907972fc80f279c67afb4501106151a7d

MINISTRY OF SCIENCE AND HIGHER EDUCATION

RUSSIAN FEDERATION

Federal State Autonomous Educational Institution of Higher Education

NORTH-CAUCASUS FEDERAL UNIVERSITY

APPROVED

Assoc. Prof. Kubanov S.I.

PhD in Medical Sciences

Dean

Faculty of Medicine and Biology

ASSESSMENT TOOLS FUND FOR THE DISCIPLINE

Biochemistry

- Specialty: 31.05.01 General Medicine
- Mode of training: Full-time
- Year of commencement of studies: 2026
- Delivered in Semester 3,4

Introduction

1. Intended for carrying out current control of academic performance progress and intermediate attestation in the discipline of «Biochemistry» for students of the specialty (majoring in) 31.05.01 General Medicine.
2. The ATF is an appendix to the program of the discipline (module) «Neurology»
3. Developer(s): Budkevich Elena Vladimirovna, Associate professor of Department of Physical Chemistry Biology and Immunology.
4. Expert examination of the ATF has been completed.

Expert group:

Chairperson: Kubanov Sergey Ismailovich, Deputy Dean of Faculty of Medicine and Biology for Practical Medicine;

Committee members: Pozdnyakova Oksana Yuryevna, Head of Department of General Medicine.

Kashnikov Vyacheslav Stanislavovich, professor of Department of General Medicine.

Employer organization representative: Vilensky I.L., Chief Physician of Independent CDL, LLC

Expert conclusion – the ATF allows evaluating the level of competency levels and is recommended to be employed in the educational process.

5. The validity period for the ATF shall be determined by the period of implementation of the educational program.

1. Description of Evaluation Criteria at Various Stages of Their Formation, Description of Evaluation Scales

Levels of formation of competence(s), indicator(s)	Descriptors			
	Minimum level not achieved (Unsatisfactory) 2 points	Minimum level (Satisfactory) 3 points	Intermediate level (Good) 4 points	High level (Excellent) 5 points
Competency: PC-13 Capable of carrying out laboratory and instrumental research methods to study properties of substances and processes involving them, processing and interpreting results obtained using theoretical knowledge and practical skills in solving natural science tasks.				
Learning outcomes for the discipline (module): Acquisition of special medical skills and their application in practical healthcare. Indicator: ID-1 PC-13 Systematizes and analyzes the results of chemical, biological, physical, medical experiments, observations, measurements, as well as results of calculations of the properties of substances and materials	Not capable of systematizing and analyzing results of experiments	Systematizes and analyzes basic results of experiments, observations, and measurements	Systematizes and analyzes the results of chemical, biological, physical, and medical experiments, observations, and measurements	Systematizes and analyzes the results of chemical, biological, physical, and medical experiments, observations, and measurements, as well as the results of calculations of the properties of substances and materials
Learning outcomes for the discipline (module): Acquisition of special medical skills and their application in practical healthcare. Indicator: ID-2 PC-13 Applies theoretical and semi-empirical models in solving problems with a natural science focus	Incapable of solving problems with a natural science focus	Solves basic problems with a natural science focus	Applies theoretical models in solving problems with a natural science focus	Applies theoretical and semi-empirical models in solving problems with a natural science focus
Learning outcomes for the discipline (module): Acquisition of special medical skills and their	Incapable of interpreting the results of theoretical and	Capable of performing theoretical and computation	Proposes an interpretation of the results of theoretical	Proposes an interpretation of the results of their own experiments and theoretical/computatio

application in practical healthcare. Indicator: ID-3 PC-13 Proposes an interpretation of the results of their own experiments and theoretical/computational works using the theoretical foundations of natural science	computational works	al works using the theoretical foundations of natural science	and computational works using the theoretical foundations of natural science	nal works using the theoretical foundations of natural science
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The evaluation of the competency formation level in the discipline is carried out on the basis of the Regulations on conducting current control of academic progress and intermediate attestation of students in higher education educational programs – Bachelor’s programs, Specialist’s programs, Master’s programs – at the Federal State Autonomous Educational Institution of Higher Education NORTH-CAUCASUS FEDERAL UNIVERSITY in its current edition.

ASSESSMENT TOOLS FOR CHECKING THE LEVEL OF COMPETENCY DEVELOPMENT

Task Number	Correct Answer	Content of the Question	Competency
1	A B	Which of the following elemental combinations represents well over 97% of all biomass on Earth? A. carbon B. hydrogen C. nitrogen D. oxygen E. phosphorous F. sulfur	PC-13
2	C	Within a eukaryotic cell, the _____ is the organelle with highly invaginated membrane structures that sequester ribosomes for protein synthesis. A. peroxisome B. lysosome C. endoplasmic reticulum D. Golgi apparatus	PC-13
3	A. fatty acid B. simple sugar	Palmitate is a/an (A) _____ and glucose is a/an (B) _____. _____. nucleotide, amino acid, fatty acid, simple sugar	PC-13
4		Reduced molecules become _____ upon donating an electron in a redox reaction. A. saturated B. reduced C. bound to oxygen D. oxidized	PC-13
5	A C E	Which of the following is/are chemical component(s) of a nucleotide? Choose one or more:	PC-13

		A. five-membered sugar B. amino group C. nitrogenous base D. sulfhydryl group E. phosphate group	
6	Carbohydrates Lipids Proteins Nucleic Acids	What are the four Organic Molecules? _____	PC-13
7	monomer	A building block of polymer? _____	PC-13
8	monosaccharides	What is the monomer for carbohydrates? _____	PC-13
9	fatty acids and glycerol	What are the building blocks for lipids? _____	PC-13
10	amino acid	What is the monomer of proteins? _____	PC-13
11	nucleotides	What is the monomer of nucleic acids? _____	PC-13
12	polypeptide chain	What is a chain of amino acids called? _____	PC-13
13	enzyme	Something that speeds up a reaction _____	PC-13
14	A	Have an amino group, carboxylic acid, hydrogen atom, and an R group attached to a central α -carbon A. Amino Acids B. Lysine C. Peptide Bonds	PC-13
15	B	Amino Acid Structure chiral (L) except for A. lysine B. glycine C. polyllysine	PC-13
16	F	Nonpolar, nonaromatic amino acid is A. Serine B. Threonine C. Asparagine D. Glutamine E. Cysteine F. Isoleucine	PC-13
17	A B C	Aromatic amino acids are A. Tryptophan B. Phenylalanine C. Tyrosine D. Alanine E. Valine F. Leucine,	PC-13
18	A	Collagen fibers are stabilized by ... bonds: A. aldol, covalent B. covalent C. aldol D. hydrogen and covalent E. adsorption	PC-13
19	B	Hyaluronic acid: A. is localized in the basement membranes B. is able to bind the large amount of water, Ca^{2+} and Na^{+} C. is branched homopolysaccharide D. is proteoglycan	PC-13
20	A	What compound in the urine is measured for evaluation of metabolism of connective tissue? A. oxyproline (hydroxyproline)	PC-13

		B. uric acid C. hyaluronic acid D. glycine E. urea	
21	C	Synthesis of pre-pro-collagen (protein) occurs: A. in reticuloendothelial system B. in Golgi body C. on ribosome D. in nucleus	PC-13
22	B	Vitamin C: A.is required for integrin synthesis B. is required for hydroxylation of proline and lysine C.is a cofactor of collagenase D.is synthesized in the body E.is a fat soluble vitamin	PC-13
23	proteoglycans	Substances that contains 5-10% protein and 90-95% of glycosaminoglycans is termed by _____	PC-13
24	C	Histamine is formed from histidine by A.transamination B.hydrolysis C.decarboxylation D.deamination	PC-13
25	D	Which amino acid is precursor of the hormones of thyroid? A.proline B.threonine C.tryptophan D. tyrosine	PC-13
26	C	Source of carbon atoms in the purine synthesis is A. ribose B. serine C. folate D.pyrimidine	PC-13
27	E	Gout is the metabolic disorder of A.synthesis of purines B.synthesis of pyrimidines C.pyrimidine catabolism D.synthesis of nucleic acids E. purine catabolism	PC-13
28	A	Bile pigments are A. the products of cholesterol metabolism B.heme-containing proteins C.products of protein catabolism D.substances, colored in black	PC-13
29	C	Which of the blood proteins perform protective function? A.iron-containing proteins B.lipoproteins C.gamma-globulins	PC-13
30	B	GH (growth hormone) is A.amino acid B.peptide C.steroid	

2. Description of the Evaluation Scale

Within the framework of the rating system, students' academic progress in each discipline is evaluated during current control and intermediate attestation. The rating system for assessing students' knowledge is based on the use of a combination of control activities to check the covered material (checkpoints), optimally located throughout the entire time interval of studying the discipline. The principles of the rating system for assessing students' knowledge are based on the requirements described in the Regulations on the organization of the educational process based on the rating system for assessing students' knowledge at NCFU.

3. Criteria for Evaluating Competencies

The grade **Excellent** shall be awarded to a student if the theoretical content of the course has been mastered completely, without gaps; the material is presented exhaustively, consistently, clearly, and logically; the student freely copes with tasks, questions, and other types of knowledge application; uses additional material in the answer; all tasks provided for by the program are completed, and the quality of their execution is evaluated by a number of points close to the maximum; analyzes the obtained results; demonstrates independence when performing tasks.

The grade **Good** is to be awarded to a student if the theoretical content of the course is mastered completely, the necessary practical competencies are mainly formed, all educational tasks provided for by the training program are completed, and the quality of their execution is sufficiently high. The student firmly knows the material, presents it competently and strictly on the merits of the matter, without allowing significant inaccuracies in answering the question.

The grade **Satisfactory** is awarded to a student in case the theoretical content of the course has been mastered in part only, but the gaps are not of a significant nature, most of the tasks provided for by the program are completed, but contain errors, the student allows inaccuracies and insufficiently correct wording when answering the question, and violations of logical sequence are observed in the presentation of the program material.

The grade **Unsatisfactory** is awarded to a student if they do not know a significant part of the program material, allow significant errors, perform practical works with great difficulty and uncertainty, the necessary practical competencies are not formed, most of the educational tasks provided for by the training program are not completed, and the quality of their execution is evaluated by a number of points close to the minimum.