

Документ подписан простой электронной подписью

Информация о владельце:

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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

Developmental biology, embryology

- Specialty: 31.05.01 General Medicine
- Mode of training: Full-time
- Year of commencement of studies: 2026
- Delivered in Semester 1

Introduction

1. Intended for carrying out current control of academic performance progress and intermediate attestation in the discipline of Developmental biology, embryology 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) Developmental biology, embryology

3. Developer(s): T.I. Dzhandarova, Head of the Department of Anatomy and Histology

4. Expert examination of the ATF has been completed.

Expert group:

Chairperson: Pakhoma T.A., Associate Professor of the Department of Anatomy and Histology

Committee members:

Yushkova L.N., Associate Professor of the Department of Anatomy and Histology;

Mamaeva M.A., Assistant Professor, Department of Anatomy and Histology

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
GPC-5 - Capable of assessing morphofunctional, physiological states, and pathological processes in the human body to solve professional tasks.				
Learning outcomes for the discipline (module): Assesses morphofunctional and physiological states and processes in the human body at the individual, group and population levels to solve professional problems AI-1 GPC-5 Identifies pathological conditions and processes in the human body to solve professional problems AI-2 GPC-5	Poorly understands the morphofunctional and physiological states and processes in the human body at the individual, group and population levels to solve professional problems	Does not fully understand the morphofunctional and physiological states and processes in the human body at the individual, group and population levels to solve professional problems	Knows the morphofunctional and physiological states and processes in the human body at the individual, group and population levels to solve professional problems	Has a high level of knowledge of morphofunctional and physiological states and processes in the human body at the individual, group and population levels to solve professional problems

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	Contents of the question	Competence
1.	a	The reproductive cell is spherical in shape, 130 μm in diameter, covered with a shiny shell and a radiant crown, and contains a haploid set of chromosomes: a) mature egg b) 2nd order oocyte c) ovogony	GPC-5
2.	b	Based on the location of yolk inclusions in the cytoplasm, the human egg cell is classified as: a) centrolecithal b) isolecithal c) moderately telolecithal	GPC-5
3.	c	The cytoplasm of a human egg cell does not contain: a) Golgi complex b) ribosomes c) cell center	GPC-5
4.	a	Cortical granules: a) participate in the formation of the fertilization membrane; b) facilitate the penetration of the sperm into the egg; c) ensure the fusion of the pronuclei.	GPC-5
5.	c	A similar sign for sperm is: a) mobility b) form c) haploid set of chromosomes	GPC-5
6.	b	The set of chromosomes in the nucleus of a human sperm: a) diploid b) haploid c) aneuploid	GPC-5
7.	c	Sperm structures containing microtubules: a) mitochondria of the connecting section b) core c) axial thread - axoneme	GPC-5
8.	a	The section of the sperm where the mitochondria are located: a) the main part of the tail b) the connecting part of the tail c) the terminal part of the tail	GPC-5
9.	c	Indicate the correct sequence of the main stages of embryogenesis: a) histogenesis and organogenesis - cleavage - gastrulation - fertilization b) cleavage-gastrulation-fertilization-histogenesis and organogenesis c) fertilization-cleavage-gastrulation-histogenesis and organogenesis	GPC-5
10.	b	The process of fusion of male and female germ cells to	GPC-5

		form a zygote: a) fragmentation b) fertilization c) implantation	
11.	a	An electron micrograph of an anterior pituitary cell reveals the rough endoplasmic reticulum and Golgi complex. Determine the function of this cell: a) synthesis and secretion of proteins b) synthesis and secretion of steroids c) intracellular digestion	GPC-5
12.	b	Rheotaxis is the ability of sperm to: a) penetration through the transparent membrane of the egg b) movement against the flow of mucus c) distant interaction with the egg.	GPC-5
13.	a	Chemotaxis is the ability of sperm to: a) penetration through the plasma membrane of the egg b) movement against the flow of mucus c) penetration through the transparent membrane of the egg	GPC-5
14.	c	Capacitation is: a) formation of the fertilization membrane b) loss of flagella by spermatozoa c) the process of sperm activation	GPC-5
15.	a	During contact interaction of gametes during fertilization, the following occurs: a) acrosome reaction b) capacitation c) chemotaxis	GPC-5
16.	b	An egg with uniform distribution of yolk is called: a) isolacital b) isolecithal c) ipsolecithal	GPC-5
17.	c	Cleavage of the human zygote: a) full uneven synchronous b) incomplete uneven synchronous c) full uneven asynchronous +	GPC-5
18.	c	Establish a correspondence between embryonic rudiments and their tissue derivatives: Sclerotome: a) striated skeletal muscle tissue b) dense, irregular connective tissue c) cartilaginous and bone tissues	GPC-5
19.	b	Establish a correspondence between embryonic rudiments and their tissue derivatives: Myotome: a) cartilaginous and bone tissues b) striated skeletal muscle tissue c) dense, irregular connective tissue	GPC-5
20.	a	Source of gonocytes : a) primary endomesoderm b) secondary endomesoderm c) tertiary endomesoderm	GPC-5

21.	from the 4th to the 8th week of embryogenesis	At what period of human embryogenesis does organ formation begin?	GPC-5
22.	Nervous system	Which organs are formed first in humans?	GPC-5
23.	by the end of the 8th week of embryogenesis	By what time during embryogenesis are all organ systems already established?	GPC-5
24.	6–7 weeks – begins, ends at the time of birth.	When does the cerebral cortex begin to form and when do these are the processes ending?	GPC-5
25.	During sexual reproduction, gametes are formed - sperm and egg	The difference between asexual and sexual reproduction of organisms.	GPC-5
26.	They contribute to the high biological quality of gametes, the ability of sperm to capacitate, and the normal structure of the reproductive tract; they prevent gametogenesis and ovulation disorders, and reproductive tract pathologies.	Factors that promote and hinder fertilization.	GPC-5
27.	the process of fusion of haploid germ cells resulting in the formation of a diploid zygote cell	What does syngamy mean?	GPC-5
28.	induction, determination, division, cell migration, growth, differentiation, cell interaction, cell death	Biological processes underlying embryonic development.	GPC-5
29.	Embryonic induction is the process of	What does embryonic induction mean?	GPC-5

	interaction between parts of a developing embryo, in which the action of one group of cells or tissues directs (induces) the development of another group, determining its future fate.		
30.	supracellular, cellular and molecular genetic	List the regulatory factors of embryogenesis.	GPC-5

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.

