

**FEDERAL STATE BUDGET EDUCATIONAL INSTITUTION OF HIGHER EDUCATION  
"ROSTOV STATE MEDICAL UNIVERSITY" OF THE MINISTRY OF HEALTH OF THE  
RUSSIAN FEDERATION**

FACULTY Treatment and prophylaxis

Evaluation materials

by discipline **Biology**

Speciality 05/31/01 General Medicine

**1. List of competencies formed by the discipline (in full or partially)**

**general professional (OPK):**

Code and name general professional competence	Achievement indicator(s) general professional competence
OPK-5. Capable of evaluating morphofunctional, physiological states and pathological processes in the human body to solve professional problems.	<p>ID 1 OPK-5 Owns the clinical algorithm laboratory and functional diagnostics when solving professional problems.</p> <p>ID 2 OPK-5 Able to evaluate the results of clinical, laboratory and functional diagnostics when solving professional problems.</p> <p>ID 3 OPK-5 Able to assess morphofunctional, physiological parameters and determine the presence of pathological processes in the human body based on clinical data laboratory, physical and instrumental research methods.</p> <p>ID 4 OPK-5 Able to determine the main indicators of the physical development and functional state of a patient with taking into account anatomical and physiological characteristics and age of the patient</p>

**2. Types of assessment materials in accordance with formed competencies**

Name competencies	Types of assessment materials	number of tasks
OPK-5	Closed tasks	25 with sample answers
	Open type tasks: Addition tasks Situational tasks	75 with sample answers

OPK-5:

Closed-type tasks: TOTAL 25 tasks.

Task 1. Instructions. Choose one correct answer.

To cleanse the intestines, use an enema with a NaCl solution:

1. isotonic
2. hypertensive
3. hypotonic
4. physiological

*Correct answer: 2. hypertensive*

Task 2. Instructions. Choose one correct answer. Informative nucleotide sequences of genes:

1. exons
2. introns
3. codons
4. replicons

*Correct answer: 1. exons*

Task 3. Instructions. Choose one correct answer. The biochemical method allows you to determine:

1. type of inheritance of a trait
2. degree of dependence of a trait on genetic and environmental factors
3. hereditary enzyme abnormalities
4. genomic mutations

*Correct answer: 3. hereditary enzyme abnormalities*

Task 4. Instructions. Choose one correct answer. The pleiotropic effect of the gene manifests itself in the syndrome:

1. Morris
2. Marfana
3. Shereshevsky-Turner
4. "cat cry"

*Correct answer: 2. Marfana*

Task 5. Instructions. Choose one correct answer. Cause of monogenic disease:

1. multiple DNA replication
2. change in chromosome number
3. change in chromosome structure
4. change in DNA structure

*Correct answer: 4. change in DNA structure*

Task 6. Instructions. Choose one correct answer. The fetal period of development in humans begins with:

1. 6th week
2. 9th week
3. 12th week
4. 20th week

*Correct answer: 2. 9th week*

Task 7. Instructions. Choose one correct answer. Type of placenta in humans:

1. desmochorionic
2. hemochorial
3. endotheliochorionic
4. epitheliochorionic

*Correct answer: 2. hemochorial*

Task 8. Instructions. Choose one correct answer.

The cause of Sprengel's disease (high position of the scapula) is a violation of:

1. heterotopia
2. heterochrony
3. substitution

4. differentiation

*Correct answer: 1. heterotopia*

Task 9. Instructions. Choose one correct answer.

For prenatal diagnosis of phenylketonuria, the following method is used:

1. amniocentesis
2. Ultrasound
3. fetoscopy
4. karyotype determination

*Correct answer: 1. amniocentesis*

Task 10. Instructions. Choose one correct answer. Aromorphosis of the digestive system of reptiles is the appearance of:

1. small intestine
2. cecum
3. colon
4. cloaca

*Correct answer: 2. cecum*

Task 11. Instructions. Choose one correct answer. The digestive system of chordates is phylogenetically related to the system:

1. nervous
2. sense organs
3. respiratory
4. excretory

*Correct answer: 3. respiratory*

Task 12. Instructions. Choose one correct answer. The causative agent of Chagas disease:

1. Trypanosoma brucei
2. Trypanosoma cruzi
3. Leishmania tropica
4. Lamblia intestinalis

*Correct answer: 2. Trypanosoma cruzi*

Task 13. Instructions. Choose one correct answer. Loss of vision is caused by larvae:

1. bovine tapeworm
2. pork tapeworm
3. wide tapeworm
4. dwarf tapeworm

*Correct answer: 2. pork tapeworm*

Task 14. Instructions. Choose one correct answer. Source of invasion by diphyllbothriasis:

1. minced pork and beef
2. liver of herbivorous mammals
3. fresh frozen fish and predatory fish caviar
4. dirty hands and unwashed vegetables

*Correct answer: 3. fresh frozen fish and caviar of predatory fish*

Task 15. Instructions. Choose one correct answer.

When adapting to cold exposure

1. decreased thyroid function
2. metabolic level increases
3. blood pressure decreases
4. peripheral vessels dilate

*Correct answer: 4. peripheral vessels dilate*

Task 16. Instructions. Choose several correct answers. During the process of protein biosynthesis, the following events occur:

1. ribosome binds to mRNA
2. organic substances accumulate in the cavities and tubules of the ER
3. Before cell division, two chromatids are formed from each chromosome
4. two amino acids attached to a ribosome interact with each other to form a peptide bond
5. During the oxidation of organic substances, energy is released
6. the peptide detaches from the mRNA

*Correct answer: 1,4,6.*

*1. ribosome connects with mRNA,*

*4 two amino acids attached to the ribosome interact with each other to form a peptide bond,*

*6. Peptide detaches from mRNA*

Task 17. Instructions. Choose several correct answers. Cell compartments containing genetic information:

1. ribosomes
2. core
3. lysosomes
4. mitochondria
5. plastids
6. EPS

*Correct answer: 2,4,5.*

*2. core*

*4. mitochondria*

*5. plastids*

Task 18. Instructions. Choose several correct answers. Sex chromatin is determined if the syndrome is suspected:

1. Patau
2. Shereshevsky-Turner
3. Edwards
4. Klinefelter
5. "cat cry"
6. polysomy X

*Correct answer: 2,4,6.*

*2. Shereshevsky-Turner*

*4. Klinefelter*

*6. Polysomy X*

Task 19. Instructions. Choose several correct answers. Differences between oogenesis and spermatogenesis:

1. the growth phase is well expressed
2. the growth phase is poorly expressed

3. the breeding phase continues throughout the reproductive period
4. the maturation phase ends with the formation of four identical cells
5. the maturation phase ends with the formation of one germ cell and 3 reduction bodies
6. no formation phase

*Correct answer: 1,5,6.*

*1. growth phase is well expressed*

*5. the maturation phase ends with the formation of one germ cell and 3 reduction bodies*

*6. no formation phase*

Task 20. Instructions. Establish a correspondence between the sex cell and its characteristics:

1. egg	A. a large amount of cytoplasm
2. sperm	B. there is no cytoplasm
	V. most membranes are absent organoids
	G. have all membrane organelles
	D. small, motile cell
	E. large, non-motile cell

*Correct answer: 1-A, D, E, 2-B, C, D.*

Task 21. Instructions. Establish correspondence between arterial gill arches and their phylogenetic transformation in humans:

1. first arterial arch	A. carotid arteries
2. second arterial arch	B. aortic arch
3. third arterial arch	B. pulmonary arteries
4. fourth arterial arch	G. is reduced
5. fifth arterial arch	
6. sixth arterial arch	

*Correct answer: 1-G, 2-G, 3-A, 4-B, 5-G, 6-B.*

Task 22. Instructions. Establish a correspondence between the disease and its carrier or pathogen:

1. scabies	A. Ixodes persulcatus
2. spring-summer encephalitis	B. Sarcoptes scabiei
3. demodicosis	B. Ornithodoros papillipes
4. tick-borne relapsing fever	G. Demodex folliculorum
5. tick-borne typhus	D. Dermacentor marginatus

*Correct answer: 1-B, 2-A, 3-D, 4-B, 5-D.*

Task 23. Instructions. Establish a correspondence between the disease and the laboratory diagnostic method:

1. three-day malaria	A. amastigote tissue forms of the parasite in skin ulcers
2. cutaneous leishmaniasis	B. schizonts in erythrocytes
3. amoebiasis	B. cysts in feces
4. toxoplasmosis	G. semilunar vegetative forms lymph
5. urogenital trichomoniasis	D. vegetative forms in urine
6. Giardiasis	E. vegetative forms of the parasite

	duodenal contents
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*Correct answer: 1-B, 2-A, 3-B, 4-D, 5-D, 6-E.*

Task 24. Instructions. Establish a correspondence between helminthiasis and preventive measures:

1. trichinosis	A. cut your nails short and change them daily lingerie
2. strongyloidiasis	B. drinking boiled water, washing vegetables and fruits
3. hookworm	B. wearing shoes, prohibiting lying on the ground
4. trichuriasis	D. do not eat meat that has not been processed sanitary and veterinary control
5. enterobiasis	
6. ascariasis	

*Correct answer: 1-G, 2-B, 3-B, 4-B, 5-A, 6-B.*

Task 25. Instructions. Match the insect with its medical significance:

1. Musca domestica	A. filaria carrier
2. Phlebotomus pappatasii	B. causative agent of phthiriasis
3. Phthirus pubis	B. leishmania vector
4. Pulex irritans	G. carrier of cysts of dysenteric amoebae
5. Culex sp.	D. carrier of plague bacteria
6. Pediculus humanus	E. pediculosis pathogen

*Correct answer: 1-G, 2-B, 3-B, 4-D, 5-A, 6-E.*

Open type tasks: TOTAL 75 tasks.

Task 1. Instructions. Instead of a dash, enter only one word: The optical part of a microscope includes the eyepiece and \_\_\_\_\_.

*Correct answer: lens.*

Task 2. Instructions. Instead of a dash, enter only one word:

The gene encoding the polypeptide chain contains exons and introns. After splicing is completed, the codogenic part of the mRNA consists only of \_\_\_\_\_.

*Correct answer: exons.*

Task 3. Instructions. Instead of a dash, enter only one word:

The cause of "cry the cat" syndrome is \_\_\_\_\_ mutation.

*Correct answer: chromosomal.*

Task 4. Instructions. Instead of a dash, enter only one word:

The main method for diagnosing human chromosomal and genomic mutations is \_\_\_\_\_ method.

*Correct answer: cytogenetic.*

Task 5. Instructions. Instead of a dash, enter only one word:

With trisomy X chromosome in women,

Barra. \_\_\_\_\_ corpuscle  
s

*Correct answer: two.*

Task 6. Instructions. Instead of a dash, enter only one word:  
The initial stages of cytodifferentiation are observed in the embryo at the stage\_\_\_\_\_.

*Correct answer: gastrula.*

Task 7. Instructions. Instead of a dash, enter two words:  
The influence of some parts of the embryo on the development of other parts is called \_\_\_\_\_.

*Correct answer: embryonic induction.*

Task 8. Instructions. Instead of a dash, enter only one word: The change in the time of formation of organs in the embryo is called\_

\_\_\_\_\_  
*Correct answer: heterochrony.*

Task 9. Instructions. Instead of a dash, enter two words:  
For laboratory diagnosis of trichinosis, biological material is \_\_\_\_\_.

*Correct answer: striated muscle (muscle tissue).*

Task 10. Instructions. Instead of a dash, enter only one word:  
The method of penetration of a parasite into the host's body through the mouthparts of the carrier during blood sucking is called\_\_\_\_\_.

*Correct answer: inoculative.*

### **Situational tasks:**

#### **Problem 11.**

When studying myocytes with an electron microscope, a laboratory doctor saw elongated cavity formations bounded by two membranes. The inner membrane of the organelle forms cristae.

Questions:

1. What organoids did the laboratory assistant see?
2. What functions do they perform?

*Right answers:*

1. Mitochondria.
2. Energy function (oxidative phosphorylation - ATP synthesis), metabolic (synthesis of steroid hormones, amino acids, regulate intracellular calcium concentration), regulate the mechanism of apoptosis.

#### **Problem 12.**

During the experiment, the laboratory assistant treated the tissue culture with a drug that blocks the function of the nucleoli.

Questions:

1. The synthesis of which organelles will be disrupted in these cells?
2. What functions do these organelles perform?

*Right answers:*

1. Ribosome.
2. Protein biosynthesis.

#### **Problem 13.**

During the experiment, the laboratory assistant used a hypotonic NaCl solution for red blood cells.

Questions:

1. What changes in red blood cells will the laboratory technician see?
2. How will the function of red blood cells change?

*Right answers:*

1. The red blood cells will increase in size and may burst.
2. The transport function (transport of gases) will be disrupted.

Problem 14.

Studying human red bone marrow using an electron microscope, the doctor saw small spherical bodies, the chemical composition of which was dominated by r-RNA.

Questions:

1. What structures were discovered?
2. How does their number change during malignant neoplasms?

*Right answers:*

1. Ribosomes.
2. Significantly increased for protein synthesis.

Problem 15.

When microcopying a plant preparation, the laboratory assistant saw that the contents of the cell were separated from the cell membrane.

Questions:

1. What phenomenon did the laboratory technician observe?
2. What causes this process?

*Right answers:*

1. Plasmolysis.
2. Impairment of the permeability of the cell plasma membrane.

Problem 16.

When microcopying hepatocytes, the laboratory assistant observed fragmentation of nuclei and cellular contents with preservation of the plasma membrane of the cell.

Questions:

1. What phenomenon did the laboratory technician observe?
2. What is the result of this process?

*Right answers:*

1. Apoptosis (programmed cell death)
2. Biological cell death.

Problem 17.

When preparing a metaphase plate, a laboratory assistant used a NaCl solution to separate chromosomes.

Questions:

1. What NaCl solution did the laboratory technician use?
2. In what direction do water molecules move?

*Right answers:*

1. Hypotonic.
2. Water molecules move into the cell.

Problem 18.

To cleanse the wounds of pus, the doctor used gauze dressings soaked in NaCl solution.

Questions:

1. What solution did the doctor use?

2. In what direction do water molecules move?

*Right answers:*

1. Hypertensive.
2. Water molecules move out of the cell.

Problem 19.

The experiment showed that in skin cells irradiated with ultraviolet light and obtained from people with xeroderma pigmentosum, the DNA structure is slowly restored, in contrast to cells from healthy people.

Questions:

1. What process underlies the restoration of DNA structure?
2. The functions of which enzymes are impaired in this disease?

*Right answers:*

1. Repair.
2. Nucleases, DNA polymerases, ligases.

Problem 20.

It has been established that some antibiotics suppress the work of bacterial DNA-dependent RNA polymerase, while other antibiotics disrupt the binding of the aminoacyl region of the ribosome to tRNA.

Questions:

1. What processes are disrupted in the cell by the action of these antibiotics?
2. Which biopolymer synthesis will be disrupted?

*Right answers:*

1. Transcription, broadcast.
2. Squirrel.

Problem 21.

It has been established that the structural part of the eukaryotic gene consists of alternating informative and non-informative sections.

Questions:

1. What are the DNA sections in a gene that do not contain amino acid sequence information called?
2. What happens to informative and non-informative regions after transcription?

*Right answers:*

1. Introns.
2. Introns are cut out and exons are stitched together (processing).

Problem 22.

Single nucleotide substitutions lead to changes in the composition of amino acids in the polypeptide.

Questions:

1. What is this property of the genetic code called?
2. Replacing which nucleotide in a triplet may not violate its meaning?

*Right answers:*

1. Degeneracy (redundancy).
2. Third nucleotide.

Problem 23.

When exposed to ultraviolet rays, pyrimidine dimers can form in the DNA molecule, which cause mutation.

Questions:

1. What is the name given to DNA's ability to repair such damage?
2. Why do irradiated cells survive so much better in light than in darkness?

*Right answers:*

1. Repair.
2. Photorepair occurs.

Problem 24.

In a prokaryotic operon, the promoter is the site of attachment of RNA polymerase, from which the transcription process begins.

1. What can block the transcription process?
2. In what phase of transcription does this occur?

*Right answers:*

1. Protein is a repressor.
2. During the transcription initiation phase.

Problem 25.

According to the DNA double helix model proposed by Watson and Crick, it was established that each of the strands is a template for the synthesis of a new daughter strand during replication.

Questions:

1. What is this principle of replication called?
2. In what cellular structures does the replication process occur?

*Right answers:*

1. Semi-conservative.
2. Nucleus, mitochondria, plastids.

Problem 26.

During a forensic medical examination, constitutive chromatin in the form of bodies adjacent to the nuclear membrane was found in the nuclei of somatic cells.

Questions:

1. Which chromosome is associated with the presence of these structures and what are they called?
2. Is it possible to determine a person's gender based on these results?

*Right answers:*

1. X chromosome, Barr bodies (sex chromatin).
2. Yes, their presence is normal for the female body.

Problem 27.

Microscopic examination of intestinal tumor tissue revealed giant cells with very large nuclei.

Questions:

1. What is the reason for the formation of such cells?
2. What is this process called?

*Right answers:*

1. An increase in chromosome sets in the nucleus leads to an increase in cell size.
2. Endomitosis (polyploidy).

Problem 28.

A child was born with an increased concentration of phenylalanine in the blood, which has a toxic effect on the brain, disrupts the formation of melanin pigment, and causes convulsions.

Questions:

1. What disease can be suspected in the child?
2. What type of inheritance is typical for this disease?

*Right answers:*

1. Phenylketonuria.
2. Autosomal recessive type.

Problem 29.

Both spouses were diagnosed with dental enamel hypoplasia. Their family had a son with normal teeth and 3 daughters with hypoplasia of tooth enamel.

Questions:

1. What is the type of inheritance of this disease?
2. What is the mother's genotype for this trait?

*Right answers:*

1. Dominant, linked to the X chromosome (X-linked dominant type).
2. The mother is heterozygous (HAHA).

Problem 30.

The spouses have blood groups I (0) and IV (AB) (according to the ABO system). Questions:

1. What blood types might their children have?
2. What type of variability is this?

*Right answers:*

1. II (A0), III (B0) blood groups.
2. Combinative variability

Problem 31.

The couple turned to a geneticist to make a prognosis for their offspring. The man was diagnosed with galactosemia (an autosomal recessive type of inheritance). The woman and all her relatives have no symptoms of the disease.

Questions:

1. Determine the probability of having sick children in this family.
2. What mutation underlies this disease?

*Right answers:*

1. 0% (all children are healthy).
2. Gene mutation.

Problem 32.

A boy was born in the maternity hospital with a diagnosis of Edwards syndrome. Questions:

1. What is the child's karyotype formula?
2. How was the diagnosis made?

*Right answers:*

1. 47, XY, 18+
2. Cytogenetic method.

Problem 33.

The couple turned to a geneticist. Their daughter was diagnosed with Shereshevsky-Turner syndrome.

Questions:

1. What is the girl's karyotype formula?
2. How was the diagnosis made?

*Right answers:*

- 1.45, X0.
2. Cytogenetic method.

Problem 34.

The child was diagnosed with hemophilia A, caused by a defect in factor VIII (antihemophilic globulin).

Questions:

1. What type of mutation underlies this disease?
2. What is the type of inheritance of the disease?

*Right answers:*

1. Gene mutation
2. X-linked recessive type of inheritance.

Problem 35.

A patient with Klinefelter syndrome came to the Moscow City Hospital. Questions:

1. What type of mutation underlies this disease?
2. How was the diagnosis made?

*Right answers:*

1. Genomic mutation.
2. Cytogenetic (karyotyping).

Problem 36.

In the maternity hospital, a newborn baby's rapid test with ferric chloride gave a positive result. Ketones were found in his urine, and an increased content of phenylpyruvic acid was found in his blood.

Questions:

1. What genetic disease can be suspected?
2. What type of mutation causes the disease?

*Right answers:*

1. Phenylketonuria.
2. Gene mutation.

Problem 37.

A newborn girl has a sharp underdevelopment of the larynx, her cry resembles the "meowing of a cat," low position of the ears, a Mongoloid shape of the eyes, and a moon-shaped face.

Questions:

1. What chromosomal syndrome can be assumed?
2. What chromosomal mutation underlies this disease?

*Right answers:*

1. Cry of the cat syndrome.
2. Deletion (loss of a short chromosome arm).

Problem 38.

A man with the following phenotype was referred to a cytogeneticist: tall stature, long limbs, eunuchoidism, female-type hair growth. Barr bodies were found in the nuclei of somatic cells of the buccal epithelium.

Questions:

1. What chromosomal syndrome can be assumed?
2. What is the patient's karyotype formula?

*Right answers:*

1. Klinefelter's syndrome. 2. 47, XXY.

Problem 39.

The newborn boy died shortly after birth. A pathological examination revealed the following defects: microcephaly, microphthalmia, bilateral cleft lip and hard palate, umbilical hernia, cryptorchidism, polydactyly. Cytogenetic examination revealed trisomy.

Questions:

1. What syndrome does this phenotype correspond to?
2. For which pair of chromosomes is trisomy observed?

*Right answers:*

1. Syndrome Patau.
2. 13 pairs each.

Problem 40.

A child was born with skin covered with a horny carapace, consisting of thick (up to 1 cm) horny scutes of gray-black color. The lips are inactive, the mouth opening is sharply narrowed. The nose and ears are deformed, the eyelids are everted, the limbs are abnormally developed, hair and nails are missing. The child died 2 hours after birth.

Questions:

1. What genetic disease can be suspected?
2. What type of mutation causes the disease?

*Right answers:*

1. Ichthyosis.
2. Gene mutation.

Problem 41.

A 25-year-old woman consulted a surgeon with complaints of the appearance of a tumor-like formation in the left axillary region, which was painful on palpation and then constantly. The appearance of swelling in the axillary region was first detected at the end of pregnancy. A sharp increase in formation and pain appeared a day after birth.

Questions:

1. What congenital defect does the patient have?
2. What cellular mechanisms underlie the occurrence of the defect?

*Correct answers:*

1. Accessory mammary gland (polymastia).
2. Violation of proliferation, apoptosis.

Problem 42.

A 32-year-old man consulted a neurologist. After lifting weights, he developed severe pain in the lumbar region and along the sciatic nerve. An X-ray examination revealed that the vertebrae of the lumbar region had a normal shape and size. The fifth lumbar vertebra was found to have nonfusion of the arches.

Questions:

1. What congenital defect does the patient have?
2. From which germ layer do vertebrae develop? Right

answers:

1. Spina bifida.

2.From mesoderm.

Problem 43.

A child was born in the maternity hospital with a cleft lip and hard palate.

Questions:

1. What cellular mechanisms underlie the occurrence of these defects?
2. What factors cause these disorders?

*Correctanswers:*

1. Migration, proliferation, cell adhesion.
2. Teratogenic, mutagenic.

Problem 44.

An examination of the oral cavity of an 8-year-old boy revealed a round, dense formation, approximately 1.5 cm in diameter, slightly below the blind foramen of the tongue. When examining the neck organs, the thyroid gland was not found in the usual place.

Questions:

1. What developmental anomaly should we think about?
2. What is the mechanism of the defect?

*Correctanswers:*

1. Ectopia of the thyroid gland.
2. Violation of heterotopia.

Problem 45.

A newborn full-term baby developed a cough, cyanosis and vomiting while feeding with milk. Vomit without signs of curdling. X-ray examination revealed that the stomach and intestines are filled with air, and the contrast agent does not enter them.

Questions:

1. What congenital defect does a newborn have?
2. What cellular mechanism of ontogenesis is disrupted?

*Correctanswers:*

1. Esophageal atresia.
2. Apoptosis.

Problem 46.

A woman came to the doctor complaining of constant aching pain in the lumbar region. In recent days, he has been experiencing increased urination, cloudy urine, and increased body temperature. An X-ray examination revealed: the size of the kidneys was increased, 2 ureters departed from each kidney.

Questions:

1. What congenital defect can lead to this pathology?
2. According to the period of ontogenesis, what type of defects does this pathology belong to?

*Correctanswers:*

1. Duplication of ureters.
2. Embryopathy.

Problem 47.

A premature baby was born with signs of respiratory failure. An X-ray examination revealed round cavities in the left lung, surrounded by a thin wall of an undifferentiated bronchus.

Questions:

1. What congenital malformation was found in the child?

2. What cellular mechanisms of ontogenesis are disrupted?

*Right answers:*

1. Bronchopulmonary cysts.
2. Migration, proliferation, adhesion.

Problem 48.

A woman suffering from alcoholism gave birth to a stillborn child with fetal alcohol syndrome. The main cause of death is underdevelopment of the brain (non-division of the forebrain into hemispheres).

Questions:

1. What congenital malformation was found in the child?
2. What cellular mechanisms of ontogenesis are disrupted?

*Right answers:*

1. Prosencephaly.
2. Cell sorting, proliferation.

Problem 49.

In a six-month-old child, the surgeon discovered a tumor-like formation in the root of the nose and between the frontal and nasal bones. The formation is small, soft in consistency, slightly pulsating on palpation, covered with skin.

Questions:

1. What congenital malformation was found in the child?
2. What cellular mechanisms of ontogenesis are disrupted?

*Right answers:*

1. Anterior nasofrontal cerebral hernia (cranioschisis).
2. Proliferation, adhesion.

Problem 50.

In England and some other countries of Western Europe, women in the first months of pregnancy received the drug thalidomide as a sedative. Subsequently, after normal births, some newborns were missing limbs.

Questions:

1. What is a birth defect in newborns called?
2. What form of variability underlies its occurrence?

*Right answers:*

1. Amelia (phocomelia).
2. Modification variability.

Problem 51.

While bathing her six-month-old son, the mother noticed that the right testicle was missing from the scrotum. At an appointment with a pediatrician, the boy was diagnosed with a dense formation in the middle part of the right inguinal canal.

Questions:

1. What is the developmental anomaly called?
2. What systemic mechanism of ontogenesis is disrupted?

*Right answers:*

1. Cryptorchidism.
2. Heterotopia.

Problem 52.

A patient consulted a doctor with complaints of heavy discharge from the urethra, burning, itching, and pain when urinating. Microscopic examination of native smears of secretions revealed unicellular pear-shaped organisms with 4 free flagella of equal length.

Questions:

1. What parasite was found?
2. How could the infection occur?

*Right answers:*

1. Trichomonas urogenital.
2. Contact-sexual method.

Problem 53.

The corpse of a newborn child was delivered to the morgue, who was found to have multiple congenital malformations. Crescent protozoa were found in the cells of the liver and spleen.

Questions:

1. What disease can be suspected?
2. What is the route of infection for a child?

*Right answers:*

1. Toxoplasmosis.
2. Transplacental.

Problem 54.

In a specimen of red bone marrow punctate, stained according to Romanovsky-Giemsa, intracellular small oval bodies 3  $\mu\text{m}$  in size were identified, the nucleus occupies 1/3 of the cell, and there is a nucleolus inside.

Questions:

1. What parasite was found?
2. What life form parasitizes humans?

*Right answers:*

1. Leishmania Donovanii.
2. Amastigote (flagellateless, leishmanial).

Problem 55.

A patient with a preliminary diagnosis of amoebiasis applied to the infectious diseases department of the hospital.

Questions:

1. What life form of the parasite confirms the diagnosis?
2. What biological material is used for diagnosis?

*Right answers:*

1. Cyst.
2. Feces.

Problem 56.

The patient's liquid feces with mucus and blood revealed large egg-shaped cells, a large nucleus in them resembles a bean, and flickering is noticeable around the shell.

Questions:

1. What parasite was found?
2. What life form has been identified?

*Right answers:*

1. Balantidium intestinalis.
2. Trophozoite.

Problem 57

The patient was diagnosed with chronic amoebiasis.

Question:

1. What was the basis for this diagnosis?
2. Which form of the parasite is pathogenic?

*Right answers:*

1. Detection of cysts with 4 nuclei.
2. Forma magna (large vegetative form).

Problem 58.

A patient was brought to the emergency hospital with a body temperature of 40-41.0, fever, profuse sweating, severe headache, and shortness of breath. A similar attack occurred three days ago. During the interview, it was established that the patient was on a business trip to one of the African countries.

Questions:

1. What disease can be suspected?
2. What biological material is taken to diagnose the disease?

*Right answers:*

1. Four-day malaria.
2. Blood.

Problem 59.

A patient was brought to the clinic with symptoms of pneumonia: temperature 38-39 C, weakness, shortness of breath, cough with a lot of sputum. The prescribed treatment turned out to be ineffective. A laboratory examination of sputum revealed eggs of a reddish-brown color, oval in shape with a cap at one of the poles, 65-70 microns in size.

Questions:

1. What disease can be suspected?
2. How could the infection occur?

*Right answers:*

1. Paragonimiasis.
2. Nutritional (oral).

Problem 60.

A patient came to the hospital with itching and a rash on the skin of his torso and left arm. Two months ago he visited Africa and swam in the Nile River. Helminth eggs with a spine were found in the urine.

Questions:

1. What diagnosis was made based on laboratory testing?
2. What form of helminth is invasive to humans?

*Right answers:*

1. Urogenital schistosomiasis.
2. Cercaria.

Problem 61.

Parents with a 4-year-old boy came to the pediatrician for an appointment. The child developed headaches, increased nervous excitability, irritability, prolonged diarrhea, loss of appetite, and epileptic seizures. When examining feces, transparent, colorless eggs were found, 35-40 microns in size, with a thin double-contour shell, thin filaments extending from the poles, and an embryo with 6 hooks inside the egg.

Questions:

1. What diagnosis was made based on laboratory testing?
2. How could the infection occur?

*Right answers:*

1. Hymenolepidosis.
2. Nutritional (oral).

Problem 62.

During a preventive X-ray examination of the chest, a round tumor-like formation was discovered in the shepherd's lungs. The edge of the tumor is smooth, there is uniform darkening inside.

Questions:

1. What disease can be suspected?
2. What kind of host is a person in the life cycle of this helminth?

*Right answers:*

1. Echinococcosis.
2. Intermediate.

Problem 63.

During a preventive examination in a kindergarten, it was revealed  
highinfection with enterobiasis.

Questions:

1. Is it possible to get rid of the disease without using medication?
2. Which population groups are most susceptible to infection with enterobiasis?

*Right answers:*

1. Yes, it is possible if autoinvasion is prevented.
2. Children get sick more often.

Problem 64.

A tumor-like formation with transparent contents was discovered in the patient's eye. The head of the parasite is visible inside.

Questions:

1. What disease can be suspected?
2. Which stage is invasive for humans?

*Right answers:*

1. Cysticercosis.
2. Egg with oncosphere.

Problem 65.

Geologists ate bear meat for a week. Ten days later everyone felt bad. The disease was acute, with high fever, muscle pain, swelling of the eyelids and face.

Questions:

1. What disease can be suspected?

2. What type and class does this helminth belong to?

*Right answers:*

1. Trichinosis.
2. Type Roundworms, class Proper roundworms.

Problem 66.

In a patient suffering from acne and inflammatory changes in the skin of the face, material was taken from the lesions for microscopy, in which they found worm-shaped arthropods with 4 pairs of shortened limbs.

Questions:

1. What diagnosis was made based on laboratory testing?
2. What type of parasite causes the disease?

*Right answers:*

1. Demodecosis.
2. Acne ironweed.

Problem 67.

A fisherman was admitted to the hospital with complaints of nausea, vomiting, pain throughout the abdomen, and low-grade fever. A laboratory examination of feces revealed oval-shaped eggs, 65-70 microns in size, yellowish-gray in color, with a tubercle at one end of the egg and a cap at the other end. Blood tests revealed anemia.

Questions:

1. What disease can be suspected?
2. How could the infection occur?

*Right answers:*

1. Diphyllbothriasis.
2. Nutritional (oral), when eating contaminated fish.

Problem 68.

During appendectomy, white helminths were found in the appendix, the anterior thread-like end of the body was immersed in the thickness of the mucous membrane.

Questions:

1. What parasite was discovered during surgery?
2. What disease does this helminth cause?

*Right answers:*

1. Whipworm.
2. Trichocephalosis.

Problem 69.

A man consulted a doctor who had eaten cattle liver and, while eating, discovered a leaf-shaped parasite measuring more than 2 cm in the liver ducts. During a scatological examination, eggs up to 130 microns in size, yellow in color with a cap, were found in the patient's feces.

Questions:

1. What parasite is found in the animal's liver?
2. Can this person become infected with helminthiasis?

*Right answers:*

1. Liver fluke.
2. No, he can not.

Problem 70.

A farmer who was breeding pigs contacted the doctor. He complained of abdominal pain and frequent loose stools mixed with blood. Large mononuclear cysts containing a large bean-shaped nucleus and a vacuole were found in the contents of the man's intestines.

Questions:

1. What parasite was found?
2. What parasitic disease can be suspected in the patient?

*Right answers:*

1. *Balantidium intestinalis*.
2. Balantidiasis.

Problem 71.

The patient was hospitalized in serious condition with bouts of fever (high fever, chills) recurring every 48 hours. The interview revealed that the patient visited Central Africa as a tourist. Microscopic examination of blood smears revealed ring-shaped parasites in the red blood cells, several pieces each, and crescent-shaped gamonts.

Questions:

1. What disease can be suspected in the patient?
2. What is the route and method of invasion by the parasite?

*Right answers:*

1. Tropical malaria.
2. Transmissible, inoculation, through the bite of a malaria mosquito.

Problem 72.

A patient came to the clinic with complaints of itching in the interdigital folds on the back of the hand, armpits, and navel area.

Questions:

1. What disease can be suspected in the patient?
2. What parasite is the causative agent of this disease?

*Right answers:*

1. Human scabies (scabiosis).
2. Itchy itching.

Problem 73.

After spending the night in an abandoned adobe building in the Kyzylkum region of Uzbekistan, several people from a geological expedition fell ill with tick-borne relapsing fever.

Questions:

1. Who is the causative agent of the disease?
2. Who is the carrier of this disease?

*Right answers:*

1. Spirochete bacteria.
2. Village mite (mites of the Argasaceae family).

Problem 74.

A boy brought an abandoned puppy from the street. When examining the animal, they found jumping insects on it.

Questions:

1. What insects were found?
2. Are they dangerous for humans? Why?

*Right answers:*

1. Flea.
2. Yes, they are a natural reservoir and carrier of plague bacteria.

Problem 75.

An examination of a patient at the dermatovenous dispensary revealed that the skin of the external genital organs is hyperemic, swollen, there are traces of scratching, and insects were found on the pubic hair.

Questions:

1. What insects were found?
2. What disease do they cause?

*Right answers:*

1. Pubic louse.
2. Phthiriasis.

### CRITERIA for assessing competencies and rating scales

Grade “unsatisfactory” (not passed) or lack of competence	Grade “satisfactory” (passed) or satisfactory level of competence development	Grade “good” (passed) or sufficient level mastering competence	Grade “excellent” (passed) or high level of mastery of competence
The student’s inability to independently demonstrate knowledge when solving tasks, lack of independence in applying skills. Lack of confirmation of completed competence indicates negative results in mastering the academic discipline	The student demonstrates independence in applying knowledge, skills and abilities to solve educational tasks in full accordance with the model given by the teacher; for tasks the solution of which was shown by the teacher, it should be considered that competence formed at a satisfactory level.	The student demonstrates independent application of knowledge, skills and abilities in solving tasks similar to the samples, which confirms the presence of competence at a higher level. The presence of such competence at a sufficient level testifies	The student demonstrates the ability to fully independently choose a solution non-standard tasks within the discipline using knowledge, skills and abilities acquired both during the development of disciplines and related disciplines, competence should be considered

		about a firmly established practical skill	formed at a high level.
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**Criteria for assessing test control:**

percentage of correct answers	Marks
91-100	Great
81-90	Fine
70-80	satisfactorily
Less than 70	unsatisfactory

When grading tasks with multiple correct answers, one error is allowed.

**Criteria for assessing situational tasks:**

Mark	Descriptors			
	understand ing the problem	analysis of the situation	solution skills situations	professional thinking
Great	full understanding of the problem. All requirements for the task have been met	high ability to analyze the situation, draw conclusions	high ability to choose a method to solve a problem, confident situation solving skills	high level of professional thinking
Fine	full understanding of the problem. All requirements for the task completed	ability to analyze a situation, draw conclusions	ability to choose a method to solve a problem, confident solving skills situations	sufficient level of professional thinking. One or two inaccuracies in the answer are allowed
satisfyflax	partial understanding of the problem. Most of the job requirements have been met.	satisfystrong ability to analyze a situation, draw conclusions	satisfactoryskills in solving situations, difficulties with choosing a method for solving a problem	sufficient level of professional thinking. More than two inaccuracies in the answer or an error in sequencessolutions
dissatisfystrictly	misunderstanding of the problem. Many requirements presented	low ability to analyze the situation	insufficient situation-solving skills	absent

	to the task, not completed. No answer. Did not have attempts to solve the problem			
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