

BIOLOGY

**TESTS FOR ENGLISH STUDYING
INTERNATIONAL STUDENTS
OF PREPARATORY DEPARTMENT**

Minsk BSMU 2017

МИНИСТЕРСТВО ЗДРАВООХРАНЕНИЯ РЕСПУБЛИКИ БЕЛАРУСЬ
БЕЛОРУССКИЙ ГОСУДАРСТВЕННЫЙ МЕДИЦИНСКИЙ УНИВЕРСИТЕТ
КАФЕДРА БИОЛОГИИ

БИОЛОГИЯ

BIOLOGY

Контрольные работы для слушателей
подготовительного отделения иностранных учащихся,
обучающихся на английском языке

2-е издание, исправленное



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Содержатся контрольные работы к итоговым занятиям по всему программному материалу для поступающих в ВУУ. Контрольные работы составлены по образцу билетов вступительного экзамена для иностранных граждан в УО БГМУ (в темах «Человек и его здоровье» и «Многообразие органического мира», «Основы цитологии» и «Основы генетики» по 10 вариантов контрольных работ). Первое издание вышло в 2016 году.

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INTRODUCTION

Biology is a system of Sciences studying living matter. The subjects it study are the origin development of life and on Earth, the basic properties of living matter, the structure and vital processes of living organisms (bacteria, plants, fungi, animals and humans), transmission patterns of genetic information, structure and evolution of the biosphere, the problems of environmental protection.

At the preparatory Department, foreign students study the structure and vital processes of the human body (anatomy and physiology); the structure and vital processes of bacteria, protists and animals (Zoology); chemical composition, structure, functions, substance and energy exchange of cells (Cytology); heredity and variation (Genetics).

Insight into these aspects of biology is necessary for successful studying many disciplines of medical university. So, Cytology, Genetics, Ecology, Parasitology and Comparative anatomy are given in more detail the in medical universities.

The basic knowledge gained at the pre-University level are the basis for studying Anatomy, Physiology, Histology, General hygiene, Microbiology and other disciplines, which are indispensable for the insight into vital functions of healthy and sick people (preventive and clinical disciplines). Academician I. V. Davydovsky called biology «the theoretical basis of medicine». Consequently, the level of training of the applicant in biology is necessary not only for admission to the medical University, but also to further successful training.

Requirements for applicants during the entry exam:

- **to possess** the basic biological concepts, biological laws and theories;
- **know and understand** basic patterns that occur in nature;
- **know the structure and vital processes** of bacteria, protists, animals and humans;
- **be able to** find out a causal connections between the structure and functions of cell organelles, structures and functions of tissues, organ and organ systems.
- **be able to** solve problems on subjects:
 - ✓ Chargaff's rules,
 - ✓ monohybrid, dihybrid crossing,
 - ✓ genetic linkage and chromosomal crossing-over,
 - ✓ sex linked inheritance,
 - ✓ making and analysis of pedigrees.

PROGRAM MATERIAL

Section 1. Fundamentals of Cytology

Cell as a basic structural-functional unit of living things. Unicellular and multicellular organisms. Sizes and shapes of cells. The main statements of the cell theory.

Chemical composition of the cell. The concept of macro- and microelements. Water and mineral salts, their role in the cell. Organic substances: proteins, fats, carbohydrates, their structure and functions.

Structure and functions of the cell membrane and cell envelope. Types of substance passing into the cell.

Main organelles of the cell (ER, ribosomes, Golgi complex, mitochondria, lysosomes, plastids, centrosomes), the peculiarities of their structure and function. Metabolism of the cell. Assimilation and dissimilation as two sides of metabolism. Autotrophic and heterotrophic, aerobic and anaerobic cells.

Structure of the cell nucleus and chromosomes. The concept of nuclear envelope, nucleoli, nuclear sap and chromatin. Functions of the nucleus, structure of chromosomes: centromere, arms, secondary constriction, satellite. Types of chromosomes: metacentric, submetacentric, acrocentric. Rules of chromosomes.

Reproduction of cells. Mitosis. Characteristics of the interphase. The stage of mitosis and its characteristics. Changes of the genetic material content during the interphase and during mitosis. Significance of mitosis.

Meiosis and its characteristics. The concept of chromosomal conjugation and crossing-over, haploid and diploid chromosome complement. Changes of the genetic material content.

Section 2. Fundamentals of Genetics

Genetics as a science. Basic concepts of Genetics: gene, genotype, phenotype; allelic, dominant and recessive genes; homo- and heterozygotes; alternative characters. Structure and functions of nucleic acids (DNA and RNA). Functions of genes. Protein synthesis in the cell. The concept of transcription and translation.

The concept of monohybrid crosses. Law of hybrid uniformity and law of segregation, their cytological basis.

Dihybrid cross. Law of independent assortment, its cytological basis.

The concept of the genetic linkage. Linkage groups. Morgan's experiments. Complete and incomplete linkage. Chromosome theory of inheritance.

Genetics of sex. The concept of autosomes and heterochromosomes. Inheritance of sex-linked characters.

Variability and its types. Modificatory variability and the norm of reaction. Genotypic variability: of combinative and mutative. Mutagenic factors. Gene, chromosome and genome mutations.

Fundamentals of human Genetics. The difficulties of studying human Genetics. Research methods: cytogenetic, biochemical, genealogical. Hereditary human diseases.

Section 3. Human Anatomy

Biology as a science. Basic properties of living things.

Structure, growth and joint types of bones. The concept of bone tissue. Structure of a joint. Human skeleton. Parts of the human skeleton. Main bones of the head, trunk and extremities.

Muscular system. Structure and functions of striated and smooth muscle tissues. Neural regulation of muscle work.

Internal environment of the body: interstitial fluid, lymph and blood; their composition and significance. The composition of blood. Circulatory system. Structure and work of the heart. Concepts of endocardium, myocardium and epicardium. Heart valves. Cardiac cycle. Automatism of cardiac activity. Concept of nervous and humoral regulation of the heart's work. Circulations. Structural features of arteries, capillaries and veins. General and pulmonary circulations (main blood vessels).

Respiratory system. The significance of breathing. Structure and functions of the respiratory tract. The structure of lungs. Respiratory motion. Vital capacity of lungs. Gas exchange in the lungs and tissues. Hygiene of respiration.

Digestive system. Structure and functions of the digestive system (oral cavity, pharynx, esophagus, stomach, intestine, digestive glands - liver and pancreas).

Excretory system. Structure and work of kidneys. Structure of the nephron. Formation in the use of primary and secondary urine.

Structure and functions of skin. Derivatives of skin.

Structure and functions of the spinal cord. Structure of a neuron.

Structure and functions of the brain. Structure and function of brain regions (medulla oblongata, cerebellum, mesencephalon, interbrain and telencephalon). Cerebral cortex, its lobes and areas.

Structure and functions of the organ of vision. Perception of light and color. Structure and functions of the hearing organ. Structure and significance of the hearing organ. Mechanism of sound perception.

Structure and functions of male and female reproductive systems. Fertilization. Birth.

Section 4. Zoology

The concept of pro- and eukaryotes. Bacteria, their structure and vital activity. Parasitic bacteria. Measures to kill bacteria.

Characteristics of protists. Features of the structure and vital activity of the Amoeba, Euglena and Infusoria. Parasitic protists. Dysentery amoeba, Giardia, malaria parasites. Peculiarities of their structure and development cycles. Diagnosis and prevention of disease they cause.

Characteristics of the phylum Flatworms. Peculiarities of structure and vital activity. Characteristics of the class Flukes. Peculiarities of structure and development cycle of the liver fluke. Prevention of fasciolosis. Characteristics of the class Tapeworms. Peculiarities of structure and development cycle of the bullish tapeworm. Prevention of cestodosis.

Features of the phylum Roundworms. Features of structure and vital activity of Ascaris lumbricoides, its development cycle. Prevention of ascariasis.

Characteristics of the phylum Arthropods. Peculiarities of the structure and vital activities.

Characteristics of the class Arachnida by the example of a garden spider.
Significance of arachnids.

Characteristics of the class Insects. The significance of insects.

Characteristics of the phylum Chordates.

Features of the structure and vital activity of a lancelet.

Characteristics of the class Fishes. Features of the structure and vital activity of fishes, their significance.

Characteristics of the class Amphibians. Features of their structure, development and vital activity, their significance.

Characteristics of the class Reptiles. Features of their structure, development and vital activity, their significance.

Characteristics of the class Mammals. Features of their structure, development and vital activity, their significance. Concepts of Yinotheria (Prototheria), marsupial and placental mammals.

Fundamentals of human Genetics. The difficulties of studying human Genetics. Research methods: cytogenetic, biochemical, genealogical. Hereditary human diseases.

GENERAL METHODOICAL INSTRUCTIONS

Using the literature recommended by the Biology department is necessary for studying program material (see the list of recommended literature).

The program is divided by **4 sections**:

1. Control test № 1 on the subject «Fundamentals of Cytology».
2. Control test № 2 on the subject «Fundamentals of Genetics».
3. Control test № 3 on the subject «Human Anatomy».
4. Control test № 4 on the subject «Zoology».

Answer sheets for control tests are at pages 87–91.

LITERATURE

1. *Biology*. Pre-University course / V. E. Butvilovsky [et al.]. Minsk : Vitposter, 2015. 190 p.

2. *Биология = Biology* : практикум для слушателей подготовительного отделения иностранных учащихся, обучающихся на английском языке / В. Э. Бутвиловский [и др.]. – 2-е изд., испр. Минск : БГМУ, 2017. 132 с.

3. *Биология* : Доуниверситетский курс. Иллюстрации = *Biology* : Pre-University course. Illustrations / В. Э. Бутвиловский [и др.]. – Минск : БГМУ, 2016. 110 с.

4. *Биология* для слушателей подготовительного отделения иностранных учащихся = *Biology for English studying international students of preparatory department* : учеб.-метод. пособие / В. Э. Бутвиловский [и др.]. – 2-е изд., испр. – Минск : БГМУ, 2017. 111 с.

**TOPIC 1. CONTROL CLASS ON SUBJECT
«FUNDAMENTALS OF CYTOLOGY»**

TEST № 1

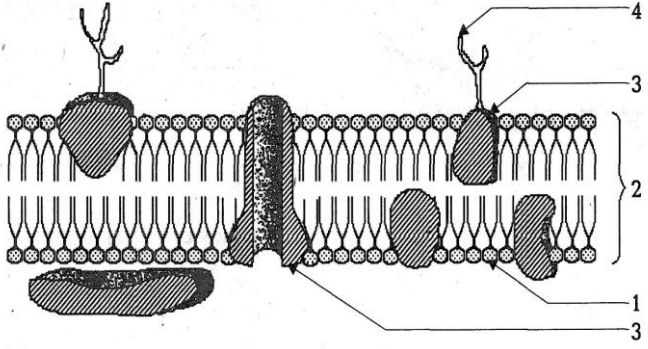
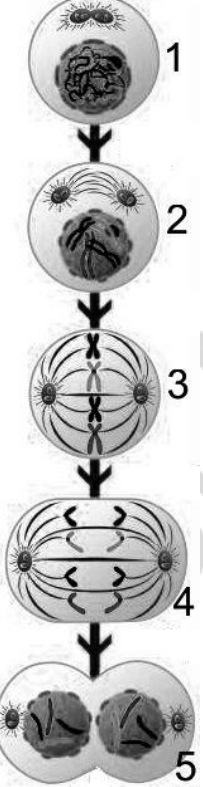
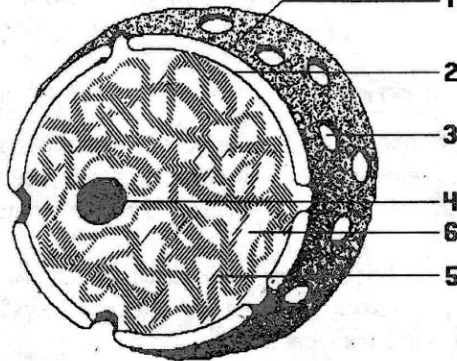
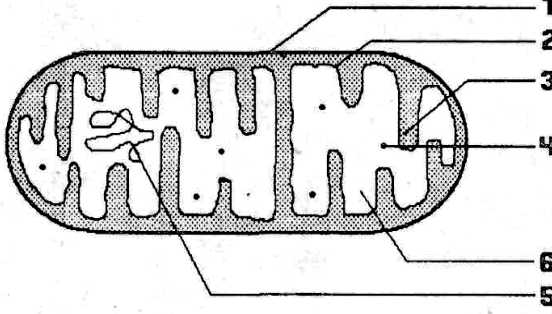
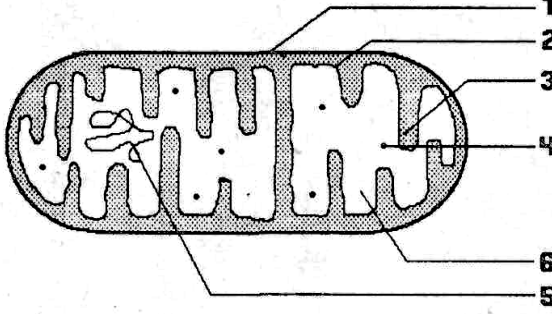
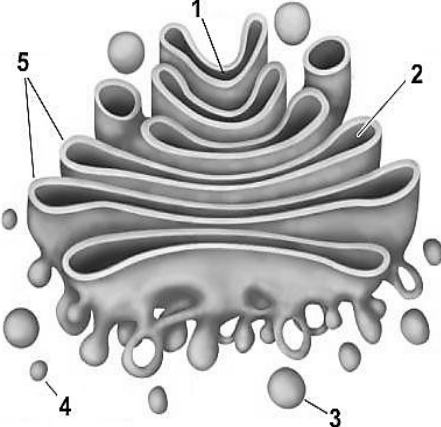
I. Select the letter of the correct answer and write it in the table:

1. **A structural, functional and genetic unit of livings is:** a) organ, b) cell, c) organelle, d) tissue, e) nucleus.
2. **The main condition of life is:** a) heredity, b) variability, c) growth, d) exchange with substance and energy, e) irritability.
3. **The number of basic tissues of human is:** a) 1, b) 2, c) 3, d) 4, e) 5.
4. **What subject studies a cell as a structural and functional unit of things?** a) Cytology, b) Histology, c) Anatomy, d) Genetics, e) Hygiene.
5. **Organic substances of the cell are** a) water, ATP, carbon dioxide, b) carbon dioxide, nucleic acids and carbohydrates, c) proteins, carbohydrate and lipids, d) hormones, vitamins, water, e) proteins, carbohydrates, minerals.
6. **Cell has:** a) cell wall, b) nucleus, c) cytoplasm, d) organelles, e) all answers are correct.
7. **Diffusion of the water through the membrane is:** a) exocytosis, b) pinocytosis, c) active transport, d) phagocytosis, e) osmosis.
8. **Autotrophic organisms are:** a) fungi, b) all bacteria, c) plants, d) animals, e) human.
9. **Cell organelles:** a) reserve food material, b) those parts of cell that have permanent structure and function, c) impermanent parts of cell, d) groups of enzymes, e) structural components of organs.
10. **Structural components of the interphase nucleus:** a) karyolemma, b) karyoplasm, c) chromatin, d) nucleoli, e) all answers are right.
11. **Basic substances of chromatin are:** a) DNA and protein, b) ATP and carbohydrates, c) DNA and lipids, d) water and RNA, e) DNA and carbohydrates.
12. **Content of genetic material in the cell during the anaphase of mitosis:** a) $2n2chr$, b) $1n2chr$, c) $2n1chr$, d) $1n1chr$, e) $2n3chr$.
13. **What occurs during interphase?** a) DNA condensation, b) chromatids are pulled to the poles of the cell, c) DNA synthesis, d) synapsis of chromosomes, e) crossing-over of homologous chromosomes.
14. **What kind of cells are formed by meiosis?** a) somatic, b) gametes, c) cells having no nucleus, d) all cells, e) diploid cells.
15. **Content of genetic material in a gamete is:** a) $2n2chr$, b) $1n2chr$, c) $2n1chr$, d) $1n1chr$, e) $2n3chr$.

II. Complete these statements and write your answers in the table:

16. The ability of living organisms to produce new individuals of their kind is ...
17. Organisms that consist of one cell are called ...
18. The process of engulfing liquid particles by the cell membrane is ...
19. Types of endoplasmic reticulum: granular and ...

III. Write the answers for the questions to the table:

	
<p>20. What is indicated with «2» in the figure?</p>	<p>22. What process is figured above?</p>
	
<p>21. What is indicated with «5» in the figure?</p>	<p>24. What is shown in the figure?</p>
	
<p>23. What is indicated with «2» in the figure?</p>	<p>24. What is shown in the figure?</p>

IV. Answer the question in writing form:

25. Cell theory.

TEST № 2

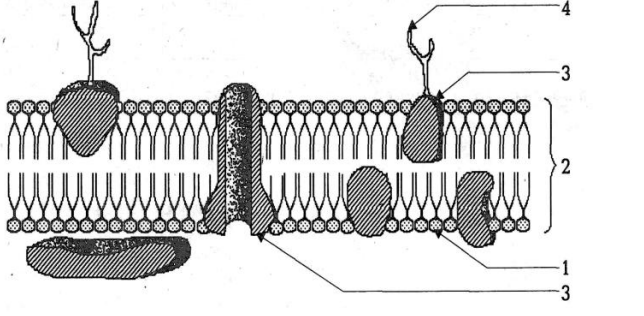
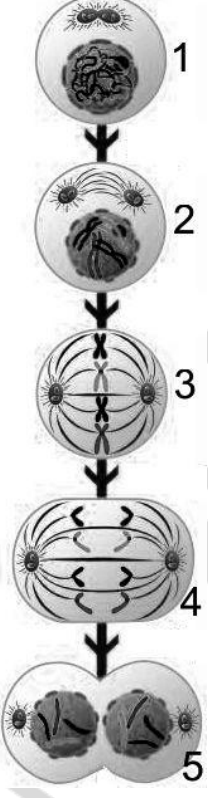
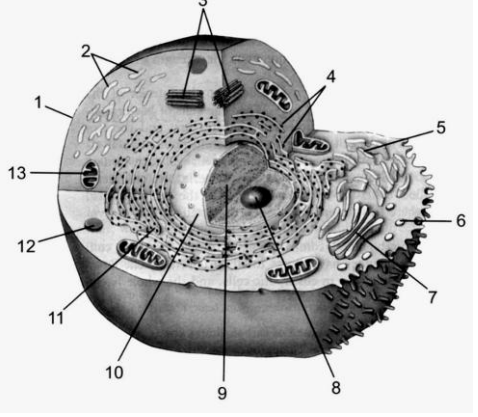
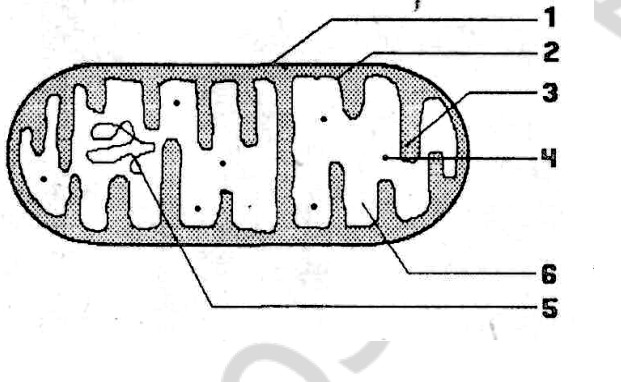
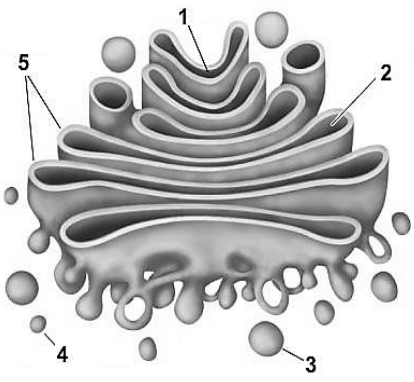
I. Select the letter of the correct answer and write it in the table:

1. **Distinction of children from parents is example of:** a) variability, b) heredity, c) reproduction, d) regeneration, e) reduction.
2. **Human body receives from the environment:** a) oxygen, carbon dioxide, b) food, oxygen, c) oxygen only, d) carbon dioxide and food, e) carbon dioxide.
3. **pH of cells is determined by:** a) calcium ions, b) potassium ions, c) balance of anions and cations, d) proteins, e) lipids.
4. **Main concepts of the Cell Theory were formulated in:** a) 1665, b) 1809, c) 1839, d) 1917, e) 1858.
5. **Cell substance that contains organelles is:** a) hyaloplasm (cytosol), b) water, c) nuclear sap (nucleoplasm), d) cell wall, e) nucleus.
6. **Hydrophilic and hydrophobic parts of a lipid are** a) head and tail, b) head and neck, c) head and body, d) body and neck, e) body and tail.
7. **Why does the cell split complex organic molecules into CO₂ and H₂O?** a) to receive energy, b) to receive amino acids, c) to receive glucose, d) to receive oxygen, e) to receive glycerol.
8. **Characteristic of heterotrophic cells:** a) can't split sugars, b) receive energy from inorganic substances, c) are capable of photosynthesis, d) can form organic substances from inorganic ones, e) use ready-made organic substances.
9. **Membrane-bound organelles of the cell are:** a) Golgi complex, ribosomes, b) ribosomes, plastids, c) Golgi complex, endoplasmic reticulum, mitochondria, d) ribosomes, e) centrosomes.
10. **Karyolemma has:** a) outer membrane, b) inner membrane, c) perinuclear space, d) pores, e) all answers are right.
11. **Subunits of ribosome are made in:** a) mitochondria, b) nucleolus, c) Golgi complex, d) plastids, e) endoplasmic reticulum.
12. **When do formation of karyolemma and cytokinesis occur?** a) anaphase, b) telophase, c) prophase, d) metaphase, e) interphase.
13. **What processes occur in cells during the interphase?** a) volume of the cytoplasm increases, b) cells carry out their functions, c) cells prepare themselves for mitosis, d) cells replicate DNA, e) all answers are right.
14. **First meiotic division is called:** a) crossing-over, b) reductional division, c) mitosis, d) synapsis, e) equational division.
15. **Content of genetic material in the cell that has just undergone meiosis is:** a) 2n2chr, b) 1n2chr, c) 2n1chr, d) 1n1chr, e) 2n3chr.

II. Complete these statements and write your answers in the table:

16. The science of life and living organisms is called ...
17. Enzymatic function is typical for ...
18. Bilayer sheet covering the cell is called ...
19. The process of splitting complex organic molecules is called ...

III. Write the answers for the questions to the table:

	
<p>20. What is indicated with «1» in the figure?</p>	
	<p>22. What is indicated with «3» in the figure?</p>
<p>21. What is indicated with «8» in the figure?</p>	
	
<p>23. What is indicated with «5» in the figure?</p>	<p>24. What is figured above?</p>

IV. Answer the question in writing form:

25. Levels of protein organization.

TEST № 3

I. Select the letter of the correct answer and write it in the table:

1. **Response of the organism to the environmental effect or factor is called:** a) reproduction, b) heredity, c) variability, d) irritability, e) regeneration.

2. **The body releases into the environment:** a) oxygen, food, b) carbon dioxide only, c) carbon dioxide and metabolic wastes, d) oxygen, e) only metabolic wastes.

3. **Basic types of cell's organic substances are** a) water, ATP, lipids, b) minerals, nucleic acids and carbohydrates, c) hormones, vitamins, water, d) proteins, carbohydrates and lipids, e) proteins, carbohydrates, minerals.

4. **Who formulated the main statements of the Cell Theory?** a) R. Browne, b) J. Purkinje, c) R. Hooke, d) T. Schwann, e) M. Schleiden.

5. **Essential molecules of the plasma membrane are:** a) proteins and water, b) proteins and lipids, c) lipids and water, d) carbohydrates and water, e) carbohydrates and proteins.

6. **Structural component that is always absent in the prokaryotic cells:** a) cell wall, b) nucleus, c) cytoplasm, d) DNA, e) ribosomes.

7. **Autotrophic cells:** a) form organic substances from inorganic ones, b) are not capable of photosynthesis, c) form inorganic substances from another inorganic substances, d) split inorganic substances into carbohydrates, e) all answers are wrong.

8. **Reduction of complex organic compounds into simpler organic substances, but not water and carbon dioxide occurs in:** a) mitochondria, b) lysosomes, c) plastids, d) ribosomes, e) centrosomes.

9. **What is located in the karyoplasm?** a) nucleoli and chromatin, b) plastids and nucleoli, c) mitochondria, d) Golgi complex, e) centrosome.

10. **Karyolemma is the membrane that covers:** a) ribosome, b) lysosome, c) nucleus, d) nucleolus, e) mitochondria.

11. **Every chromosome separates into 2 chromatids during:** a) anaphase, b) telophase, c) prophase, d) metaphase, e) interphase.

12. **Content of genetic material in presynthetic period of interphase:** a) $1n2chr$, b) $2n1chr$, c) $2n2chr$, d) $2n3chr$, e) $1n1chr$.

13. **Mitosis consists of:** a) one division, b) 2 divisions, c) 1 or 2 divisions, d) 3 divisions, e) 2 or 3 divisions.

14. **As result of the meiosis the cell divides into:** a) two diploid cells, b) four haploid cells, c) two haploid cells, d) four diploid cells, e) one haploid cell.

15. **Content of genetic material in the cell during the metaphase of meiosis II:** a) $2n2chr$, b) $1n2chr$, c) $2n1chr$, d) $1n1chr$, e) $2n3chr$.

II. Complete these statements and write your answers in the table:

16. A similarity of children and parents is an example of ...

17. Chemical elements that are abundant in the cells are called ...

18. Tails of lipid molecules are ...

19. Green plastids of the plant cell are called ...

III. Write the answers for the questions to the table:

<p>20. What is the structural unit of the substance figured above?</p>	
	<p>22. What is the number of the stage in which crossing-over occurs?</p>
<p>21. What is indicated with «9» in the figure?</p>	
	<p>24. What is indicated with «1» in the figure?</p>
<p>23. What is indicated with «3» in the figure?</p>	

IV. Answer the question in writing form:

25. Structure of plasma membrane.

TEST № 4

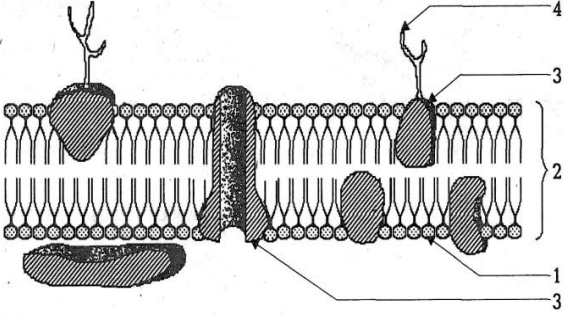
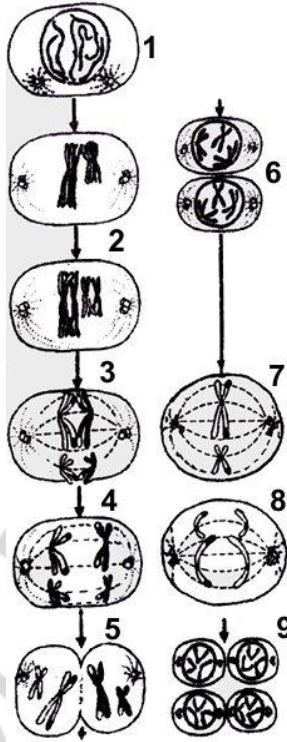
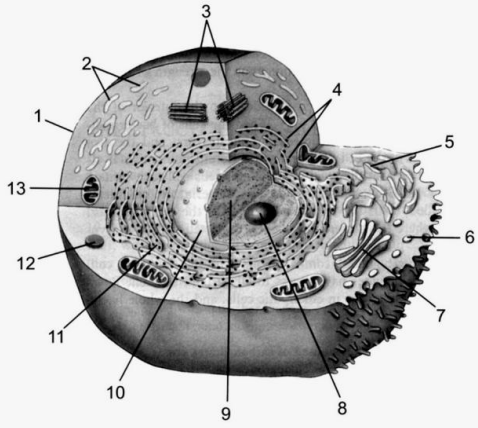
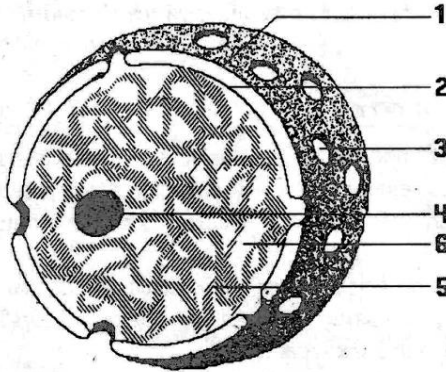
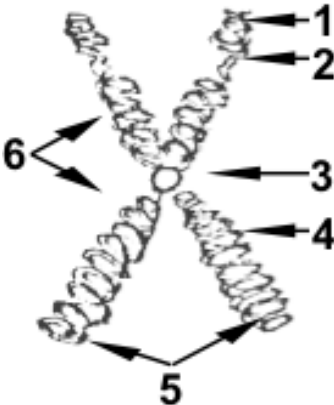
I. Select the letter of the correct answer and write it in the table:

1. **A structural, functional and genetic unit of livings is:** a) organ, b) cell, c) organelle, d) tissue, e) nucleus.
2. **Reproduction is an ability of living organisms:** a) to repair damaged body parts, b) to create new individuals of their kind, c) to change, d) to move, e) to release metabolic wastes into the environment.
3. **Functions of proteins are:** a) structural, b) enzymatic, c) motion, transport, d) regulatory, energetic, e) all answers are right.
4. **Main statements of the Cell Theory are:** a) all living things are composed of one or more cells, b) plant and animal cells have similar structure and physiology, c) all cells originate from pre-existing cells, d) cells are the basic components of living organisms, e) all answers are right.
5. **Structural function of the plasma membrane consists in:** a) performing protection of the cell, b) being a part of organelles, c) storing of substances, d) transporting substances into the cell, e) taking part in metabolism.
6. **Molecules of lipids have:** a) head and body, b) head and neck, c) head and tail, d) body and neck, e) head, body and tail.
7. **Heterotrophic cells:** a) use ready-made organic substances, b) make organic substances from inorganic ones, c) are capable of photosynthesis, d) form inorganic substances from another inorganic substances, e) break inorganic substances.
8. **Transport of substances to within the cell is the function of:** a) plasma membrane, b) endoplasmic reticulum and Golgi complex, c) lysosomes, d) mitochondria, e) ribosomes.
9. **Subunits of ribosome are assembled in:** a) vacuoles, b) nucleolus, c) Golgi complex, d) plastids, e) endoplasmic reticulum.
10. **Components of the nucleus:** a) karyolemma, b) karyoplasm, c) chromatin, d) nucleoli, e) all answers are right.
11. **What takes place during interphase?** a) DNA condensation, b) contraction of fibers of the division spindle, c) DNA synthesis, d) synapsis of chromosomes, e) crossing-over (crossover).
12. **DNA synthesis occurs during:** a) prophase of mitosis, b) telophase of mitosis, c) interphase, d) anaphase, e) metaphase.
13. **Content of genetic material during the postmitotic period of interphase:** a) $1n2chr$, b) $2n1chr$, c) $2n2chr$, d) $1n4chr$, e) $1n1chr$.
14. **Meiosis includes:** a) one division, b) 2 divisions, c) 3 divisions, d) 4 divisions, e) 5 divisions
15. **Content of genetic material in the cell during the metaphase of meiosis I:** a) $1n_{biv}1chr$, b) $1n_{biv}2chr$, c) $2n_{biv}4chr$, d) $2n_{biv}2chr$, e) $1n_{biv}4chr$.

II. Complete these statements and write your answers in the table:

16. Difference of children and parents is an example of ...
17. Cell has a cell wall, cytoplasm, ... and organelles.
18. Bacteria are engulfed by leucocytes by means of ...
19. The function of ribosomes is synthesis of ...

III. Write the answers for the questions to the table:

	
<p>20. What is figured above?</p>	
	
<p>21. What is indicated with «7» in the figure?</p>	<p>22. What is indicated with «7» in the figure?</p>
	
<p>23. What is indicated with «2» in the figure?</p>	<p>24. Classify this chromosome according to the length of its arms.</p>

IV. Answer the question in writing form:

25. Anabolic system of the cell.

TEST № 5

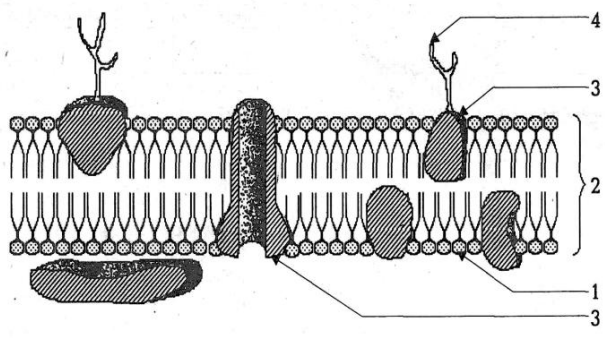
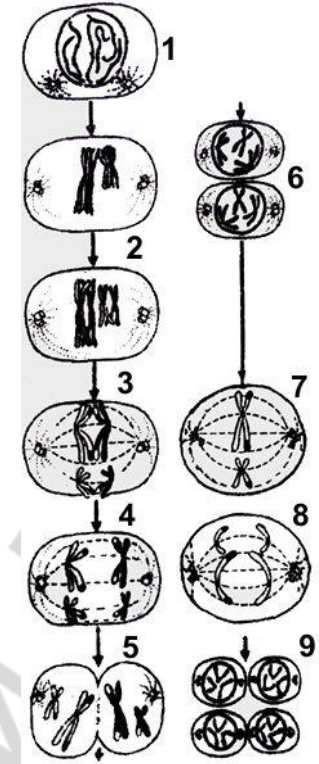
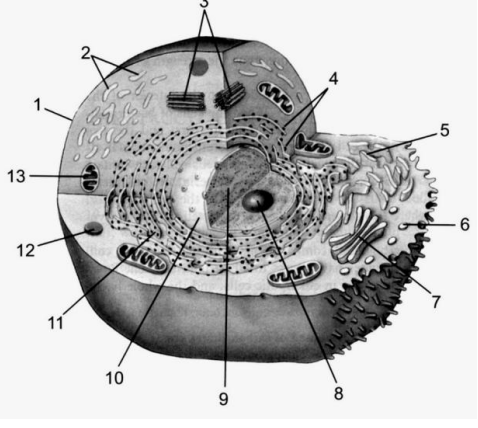
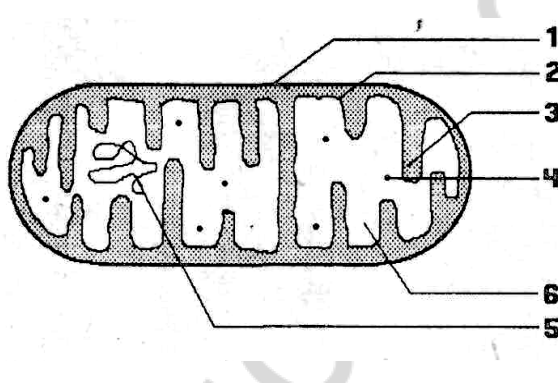
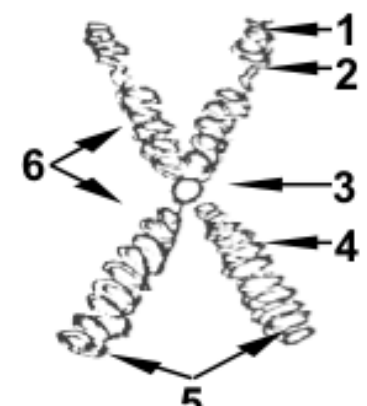
I. Select the letter of the correct answer and write it in the table:

1. **The body releases into the environment:** a) oxygen, food, b) only carbon dioxide, c) carbon dioxide and metabolic wastes, d) oxygen, e) only metabolic wastes.
2. **Similarity of children and parents is a:** a) variability, b) heredity, c) reproduction, d) regeneration, e) reduction.
3. **Examples of simple carbohydrates:** a) DNA and RNA, b) RNA and glucose, c) DNA and ribose, d) fructose, glucose, ribose, e) ATP, RNA.
4. **Formation of an organism or an organ in course of life is:** a) development, b) growth, c) genetic heredity, d) metabolism, e) variability (mutation).
5. **Hydrophobic tails of lipids are directed toward:** a) each other, b) external side of membrane, c) heads, d) random sides, e) proteins.
6. **What is always absent in prokaryotic cells?** a) membrane-bound organelles, b) flagella, c) mesosomes, d) DNA, e) ribosomes.
7. **During photosynthesis organic substances are formed from:** a) water and carbon dioxide, b) oxygen and lipids, c) carbon dioxide and oxygen, d) oxygen only, e) carbon dioxide, water and oxygen.
8. **Ribosomes are located:** a) in cytoplasm and endoplasmic reticulum, b) Golgi complex, c) nucleus, d) nucleolus, e) centrosome.
9. **A metaphase chromosome is made of:** a) chromatin, b) histones, c) DNA and ATP, d) satellite, e) RNA and DNA.
10. **Chromatin consists of:** a) DNA and protein, b) ATP and carbohydrates, c) DNA and lipids, d) water and RNA, e) DNA and carbohydrates.
11. **Features of submetacentric chromosomes are:** a) arms of the same length, b) arms of the different length, c) one arm is absent, d) one arm is much shorter than the other one, e) all answers are false.
12. **Content of genetic material in the prophase of mitosis:** a) $2n2chr$, b) $1n2chr$, c) $2n1chr$, d) $1n1chr$, e) $2n3chr$.
13. **Mitosis is:** a) formation of gametes, b) sexual reproduction, c) division of somatic cells, d) transport of substances, e) cell grows.
14. **Synapsis is:** a) connection of homologous chromosomes, b) connection of non-homologous chromosomes, c) exchange between the same regions of homologous chromosomes, d) exchange between different regions of homologous chromosomes, e) exchange of centromeres of chromosomes.
15. **Content of genetic material in the cell during the prophase of meiosis II:** a) $2n2chr$, b) $1n2chr$, c) $2n1chr$, d) $1n1chr$, e) $2n3chr$.

II. Complete these statements and write your answers in the table:

16. A property of an organism to maintain constancy of its internal environment is ...
17. Balance of cations and anions determines ... of cytoplasm.
18. Any cell is covered with ...
19. The function of mitochondria is synthesis of ...

II. Write the answers for the questions to the table:

	
<p>20. What is indicated with «3» in the figure?</p>	
	<p>22. What process is figured above?</p>
<p>21. What is indicated with «3» in the figure?</p>	
	
<p>23. What is indicated with «4» in the figure?</p>	<p>24. What is indicated with «2» in the figure?</p>

IV. Answer the question in writing form:

25. Catabolic system of a cell.

TEST № 6

I. Select the letter of the correct answer and write it in the table:

1. Features of living organisms which differ them from inanimate objects are: a) presence of metabolism, heredity and variability, b) absence of variability and presence of metabolism, c) presence of growth, variability and absence of irritability, d) presence of irritability and absence of metabolism, e) presence of growth and absence of irritability.

2. Distinction of children from parents is a: a) variability, b) heredity, c) reproduction, d) regeneration, e) reduction.

3. Simple carbohydrates are: a) DNA and lactose, b) RNA and deoxyribose, c) ribose and deoxyribose, d) glucose, ribose and ATP, e) ATP, RNA.

4. Nucleic acids contain: a) fructose and ribose, b) ribose and deoxyribose, c) glucose and fructose, d) glucose and deoxyribose, e) fructose and deoxyribose.

5. Hydrophilic heads of lipids are directed toward: a) each other, b) proteins, c) external side of membrane, d) tails, e) random sides.

6. Molecules embedded into the plasma membrane are: a) proteins and DNA, b) proteins and RNA, c) lipids and ATP, d) carbohydrates and RNA, e) carbohydrates and proteins.

7. According to the type of assimilation cells could be: a) autotrophic and anaerobic, b) autotrophic and heterotrophic, c) heterotrophic and aerobic, d) heterotrophic and anaerobic, e) aerobic and anaerobic.

8. Functions of centrosome are followed: a) involved in cell division b) involved in protein synthesis, c) involved in formation of lysosomes, d) ATP synthesis, e) lipid synthesis.

9. A metaphase chromosome consists of: a) 2 chromatids, b) centromeres, c) chromosome arms, d) satellite, e) all answers are right.

10. A metacentric chromosome: a) consists of one arm, b) consists of two arms of same length, c) consists of two arms of with different length length, d) consists of two arms and one of them is very short, e) all answers are false.

11. When the formation of karyolemma and division of maternal cytoplasm occur? a) anaphase, b) telophase, c) prophase, d) metaphase, e) interphase.

12. Phases of mitosis: a) prophase, metaphase, anaphase and telophase, b) prophase, metaphase, proanaphase and telophase, c) prophase, metaphase and anaphase, d) prophase, metaphase, anaphase and interkinesis, e) interphase, metaphase, anaphase and telofase.

13. Content of genetic material during premitotic period of interphase: a) $1n2chr$, b) $2n1chr$, c) $2n2chr$, d) $1n2chr$, e) $1n1chr$.

14. Synapsis of chromosomes occurs in: a) prophase II, b) metaphase I, c) prophase I, d) anaphase I, e) prophase of mitosis.

15. Cells that are formed as result of meiosis are: a) somatic cells, b) gametes, c) polyploid cells, d) nervous tissue cells, e) diploid cells.

II. Complete these statements and write your answers in the table:

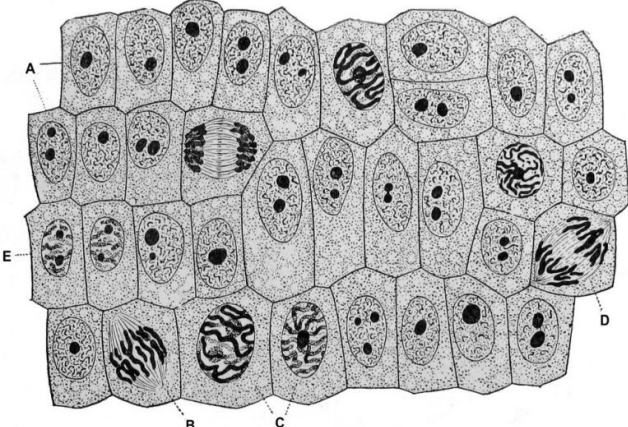
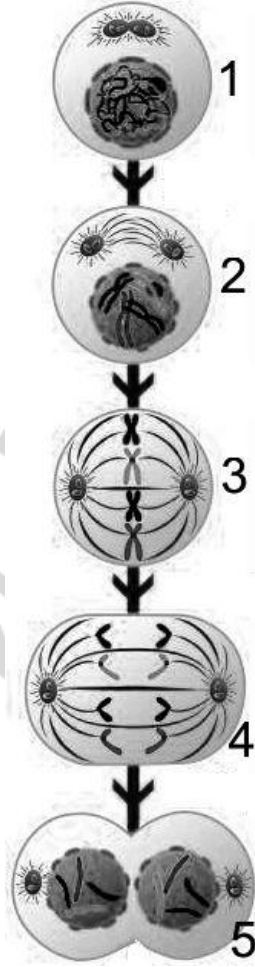
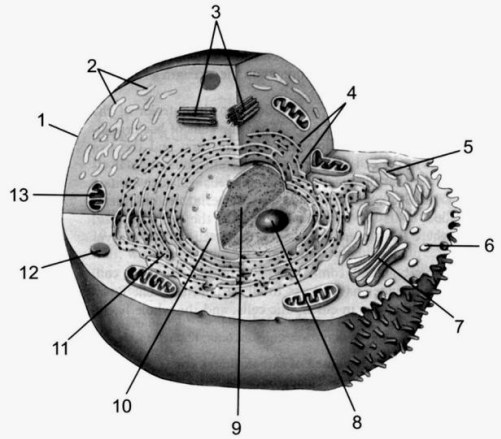
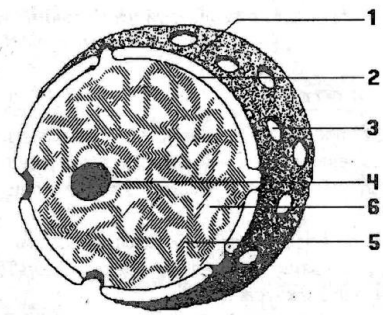
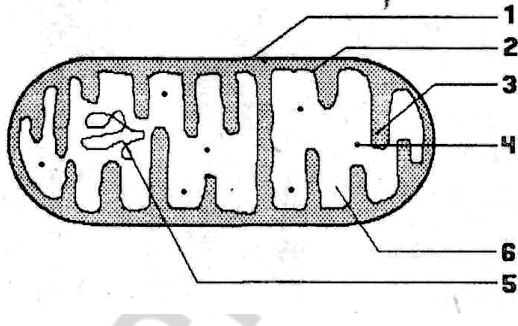
16. Development of an organism from being a zygote to death is its ...

17. A structural and functional unit of living things is ...

18. Passive transport of water through the membrane is ...

19. Sum of all reactions of synthesis in the cell is ...

III. Write the answers for the questions to the table:

	
<p>20. What process is observed in the cells figured above?</p>	
	
<p>21. What is indicated with «4» in the figure?</p>	<p>22. What is indicated with «2» in the figure?</p>
	<p>24. What is indicated with «5» in the figure?</p>
<p>23. What is the name of the space between «1» and «2»?</p>	

IV. Answer the question in writing form:

25. Rules of chromosomes.

TEST № 7

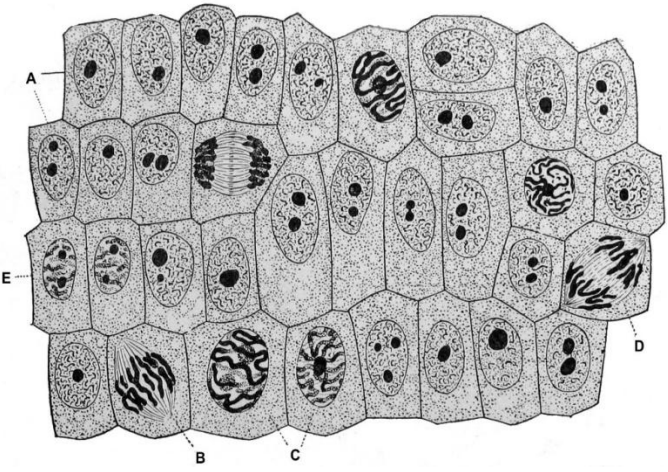
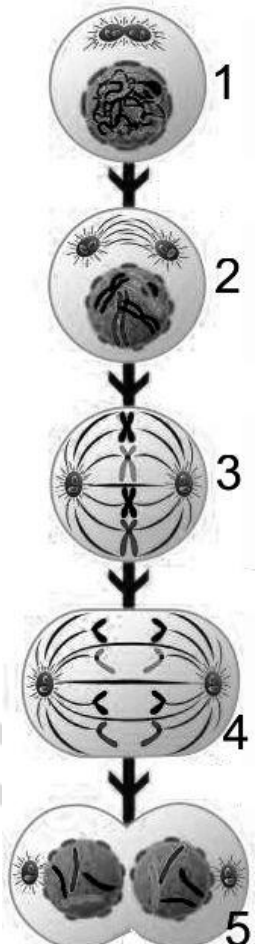
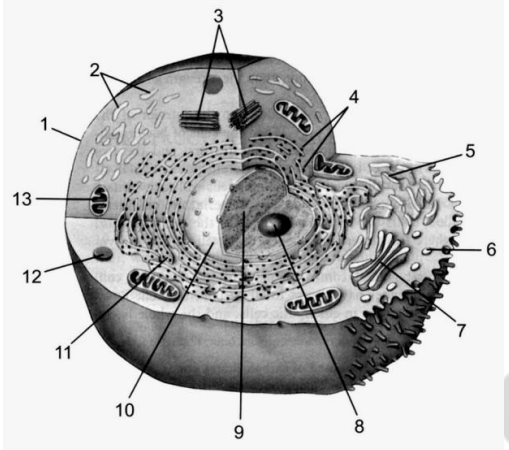
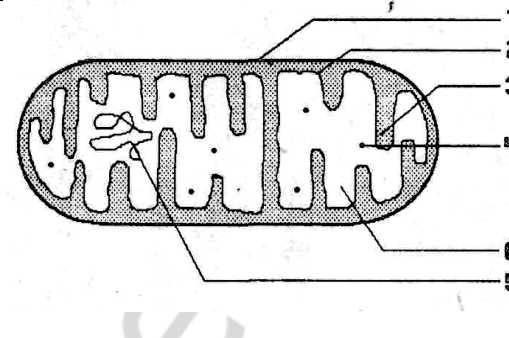
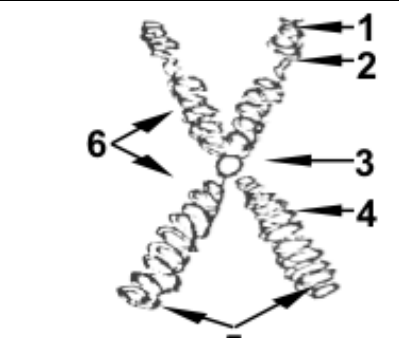
I. Select the letter of the correct answer and write it in the table:

1. **The body releases into the environment:** a) oxygen, food, b) only carbon dioxide, c) carbon dioxide and metabolic wastes, d) oxygen, e) only metabolic wastes.
2. **Organism's responsibility to the environmental factors is called:** a) reproduction, b) heredity, c) variability, d) irritability, e) regeneration.
3. **Functions of lipids are:** a) energetic, b) structural, c) thermoregulatory, d) storage, e) all answers are right.
4. **Macroelements are:** a) carbon and manganese, b) carbon and calcium, c) copper and oxygen, d) oxygen and zinc, e) manganese and phosphorus.
5. **Hydrophobic tails of lipids are directed toward:** a) each other, b) external side of membrane, c) heads, d) random sides, e) proteins.
6. **The main property of the membrane is** a) elasticity, b) self-locking, c) selective permeability, d) viscosity, e) stability.
7. **According to the type of dissimilation cells could be:** a) autotrophic and anaerobic, b) autotrophic and heterotrophic, c) aerobic and anaerobic, d) heterotrophic and anaerobic, e) heterotrophic and aerobic.
8. **Functions of mitochondria are:** a) lipid synthesis, b) carbohydrate synthesis, c) splitting of glucose, d) ATP synthesis, e) photosynthesis.
9. **Features of the metacentric chromosome are:** a) arms of the same length, b) arms are absent, c) one arm is very long while another one is very short, d) one arm is absent, e) all answers are false.
10. **The number of chromatids in a metaphase chromosome is:** a) 1, b) 2, c) 1-2, d) 3, e) 2-3.
11. **What takes place in the cell during the metaphase?** a) DNA condensation, b) chromosomes are located on the equator of a cell and spindle fibers attach to centromeres, c) chromosomes separate into 2 chromatids, d) membrane of the nucleus disappear, e) DNA synthesis.
12. **DNA condensation occurs during:** a) anaphase, b) telophase, c) prophase, d) metaphase, e) interphase.
13. **Content of genetic material in the telophase of mitosis:** a) $2n2chr$, b) $1n2chr$, c) $2n1chr$, d) $1n1chr$, e) $1n4chr$.
14. **Crossing-over is the process occurring between:** a) homologous chromosomes, b) non-homologous chromosomes, c) all chromosomes, d) metacentric chromosomes, e) chromatids of a chromosome.
15. **Content of genetic material in the cell during prophase of meiosis II:** a) $2n2chr$, b) $1n2chr$, c) $2n1chr$, d) $1n1chr$, e) $1n_{biv}4chr$.

II. Complete these statements and write your answers in the table:

16. All living things consist of...
17. Structural unit of bilayer covering the cell is ...
18. Membranes of granular endoplasmic reticulum have ... on the surface.
19. A chromosome where one arm is very long and the other one is very short is called ...

III. Write the answers for the questions to the table:

	
<p>20. What is the letter designating the cell that is undergoing interphase?</p>	<p>22. What is the complement of genetic material in the cell number 5?</p>
	<p>23. What is indicated with «3» in the figure?</p>
	
<p>24. What is indicated with «5» in the figure?</p>	

IV. Answer the question in writing form:

25. Meiosis I.

TEST № 8

I. Select the letter of the correct answer and write it in the table:

1. **Similarity of children and parents is a:** a) variability, b) heredity, c) reproduction, d) regeneration, e) reduction.

2. **A structural, functional and genetic unit of livings is:** a) organ, b) cell, c) organelle, d) tissue, e) nucleus.

3. **Microelements of cells are:** a) zinc and copper, b) carbon and sulfur, c) calcium and potassium, d) copper and carbon, e) iron and phosphorus.

4. **Nucleic acids contain:** a) fructose and ribose, b) ribose and deoxyribose, c) glucose and fructose, d) glucose and deoxyribose, e) fructose and deoxyribose.

5. **Multicellular organisms are** a) bacteria and plants, b) Amoeba and Infusorians, c) bacteria and protists, d) fungi and plants, e) viruses.

6. **Active transport is:** a) flow of substances down the concentration gradient that does not require energy, b) inflow of substances inside the cell against the concentration gradient that requires energy, c) process of engulfing solid particles by the cell membrane and their transfer into cytoplasm, d) process of engulfing liquid particles by the cell membrane and their transfer into cytoplasm, e) water supply of the cell.

7. **Structural function of the membrane is:** a) to protect cells, b) to form organelles, c) to contain enzymes, d) to transport substances into the cell, e) have part in metabolism.

8. **Functions of chloroplasts are:** a) lipid synthesis, b) photo-synthesis, c) protein synthesis, d) splitting of organic molecules, e) involved in cell division.

9. **Functions of the centrosomes:** a) involved in cell division, b) involved in protein synthesis, c) involved in formation of lysosomes, d) ATP synthesis, e) lipid synthesis.

10. **Principle of pairing of chromosomes:** a) chromosomes of different pairs are identical in size, b) chromosomes of different pairs vary in shape, c) each chromosome in karyotype has a homologous one, d) new daughter chromosome originate from maternal one, e) cells of organism that belongs to a certain species have constant number of chromosome.

11. **Features of the submetacentric chromosome are:** a) arms of the same length, b) arms of the different length, c) one arm is very long and another one is very short, d) one arm is absent, e) all answers are false.

12. **Content of genetic material in the cell during presynthetic period of the interphase:** a) $1n2chr$, b) $2n1chr$, c) $2n2chr$, d) $1n4chr$, e) $1n1chr$.

13. **Content of genetic material at each cell pole during the anaphase of mitosis:** a) $2n2chr$, b) $1n2chr$, c) $2n1chr$, d) $1n1chr$, e) $2n4chr$.

14. **During what phase of meiosis pairs of homologous chromosomes are situated on the equator of a cell?** a) metaphase I, b) prophase I, c) telophase I, d) telophase II, e) anaphase I.

15. **Meiosis consists of:** a) one division, b) 2 divisions, c) 1 or 2 divisions, d) 3 divisions, e) 2 or 3 divisions.

II. Complete these statements and write your answers in the table:

16. A historical development of a species is its ...

17. Monomers of proteins are ...

18. Heads of lipid molecules are ...
 19. Chloroplast contains a green pigment ...

III. Write the answers for the questions to the table:

<p>20. What is the letter designating the cell that undergoes anaphase?</p>	
	<p>21. What is indicated with «4» in the figure?</p>
	<p>22. What is indicated with «9» in the figure?</p>
<p>23. What is indicated with «5» in the figure?</p>	<p>24. What is the name of the structure that consist of elements «1» and «2»?</p>

IV. Answer the question in writing form:

25. Cell cycle.

TEST № 9

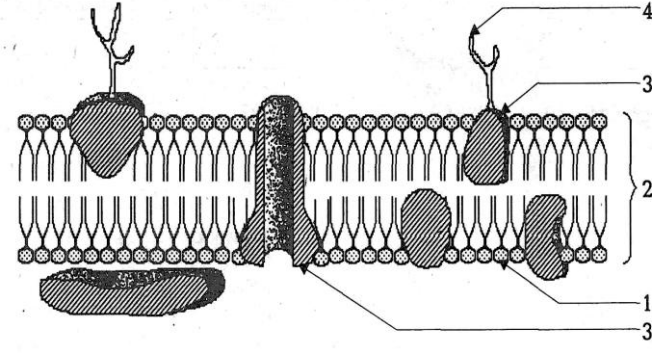
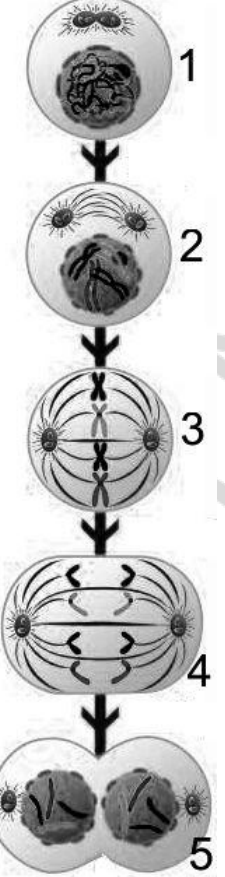
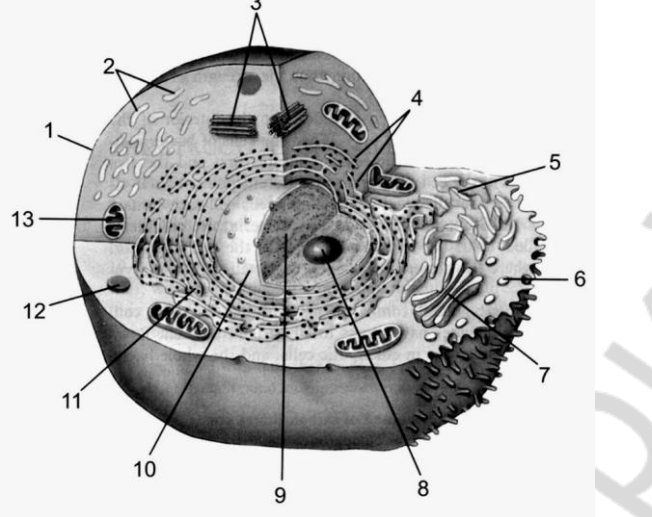
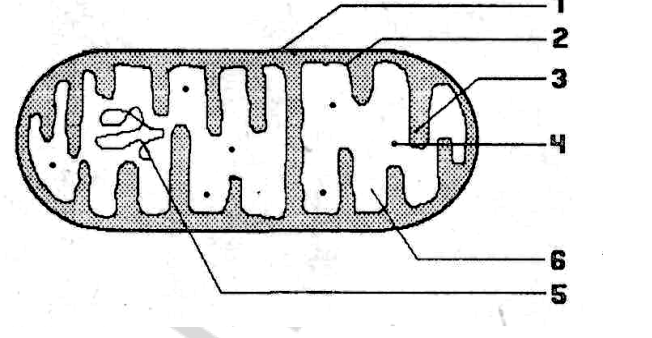
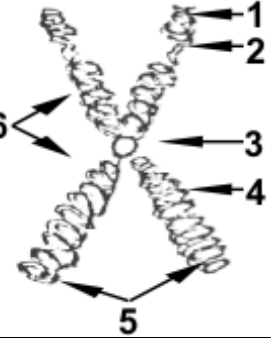
I. Select the letter of the correct answer and write it in the table:

1. **The main condition of life is:** a) heredity, b) variability, c) growth, d) exchange of substances and energy with the environment, e) irritability.
2. **Components of the cell are:** a) membrane, nucleus, protoplasm, b) membrane and cytoplasm, c) membrane, cytoplasm and nucleus, d) membrane, nucleus and organelles, e) nucleus and cytoplasm.
3. **Inorganic substances are:** a) proteins and carbohydrates, b) lipids and carbohydrates, c) proteins and lipids, d) water and minerals, e) water and lipids.
4. **Multicellular organisms are:** a) bacteria, b) Amoebae, c) Infusorians, d) animals, plants and human, e) viruses.
5. **The flow of substances down the concentration gradient is:** a) phagocytosis, b) pinocytosis, c) passive transport, d) active transport, e) osmosis.
6. **A component that is always absent in procaryotic cells:** a) cell wall, b) nucleus, c) cytoplasm, d) DNA, e) ribosomes.
7. **Formation of complex organic molecules from simple substances is called:** a) diffusion, b) assimilation, c) dissimilation, d) diffusion, e) osmosis.
8. **Metabolism includes:** a) reproduction and assimilation, b) irritability and dissimilation, c) assimilation and dissimilation, d) reproduction and dissimilation, e) growth and reproduction.
9. **Functions of the nucleus:** a) storage and transfer of genetic information, b) protein synthesis, c) lipid synthesis, d) carbohydrate synthesis, e) ATP synthesis.
10. **Features of acrocentric chromosome are:** a) arms of the same length, b) arms of the different length, c) one arm is very long while another is very short, d) has no centromere, e) all answers are false.
11. **When the formation of karyolemma and division of maternal cytoplasm occur?** a) anaphase, b) telophase, c) prophase, d) metaphase, e) interphase.
12. **What takes place during the metaphase?** a) DNA condensation, b) chromosomes are located on the equator of a cell and spindle fibers attach to centromeres, c) chromosomes separate into 2 chromatids, d) chromatids are called daughter chromosome, e) DNA synthesis.
13. **Content of genetic material during postsynthetic period of interphase:** a) $1n2chr$, b) $2n1chr$, c) $2n2chr$, d) $1n4chr$, e) $1n1chr$.
14. **During what phase of meiosis homologous chromosomes diverge to the cellular poles?:** a) metaphase I, b) prophase I, c) telophase I, d) anaphase II, e) anaphase I.
15. **Meiosis consists of:** a) 1 prophase, 2 metaphases, 2 anaphases and 2 telophases, b) 2 prophases, 1 metaphase, 2 anaphases and 2 telophases, c) 2 prophases, 2 metaphases, 1 anaphase and 2 telophases, d) 2 prophases, 2 metaphases, 2 anaphases and 2 telophases.

II. Complete these statements and write your answers in the table:

16. Oxygen is transported to the cells by a protein ...
17. Colloid solution where organelles are located is called ...
18. Parts of the cytoplasm with certain structure and functions are called ...
19. Segment of the chromosome separated by the secondary constriction is called ...

III. Write the answers for the questions to the table:

	
<p>20. What is indicated with «4» in the figure?</p>	
	<p>22. What is indicated with «4» in the figure?</p>
<p>21. What is indicated with «13» in the figure?</p>	
<p>23. What is indicated with «1» in the figure?</p>	
<p>24. What is indicated with «3» in the figure?</p>	

IV. Answer the question in writing form:

25. Mitosis.

TEST № 10

I. Select the letter of the correct answer and write it in the table:

1. **Human body receives from the environment:** a) water and carbon dioxide, b) oxygen, c) urea, d) carbon dioxide and food, e) carbon dioxide and food.

2. **Features that differ living organisms from inanimate objects are:** a) presence of metabolism, heredity and variability, b) absence of variability and presence of metabolism, c) presence of growth, variability and absence of irritability, d) presence of irritability and absence of metabolism, e) presence of growth and absence of irritability.

3. **The Cell Theory was formulated in:** a) 1917, b) 1858, c) 1839, d) 1665, e) 1809.

4. **Bone tissue contains minerals of:** a) potassium and calcium, b) calcium and phosphorus, c) copper and phosphorus, d) iron and potassium, e) sodium and chlorine.

5. **Cells pH is determined by:** a) calcium salts, b) histone proteins, c) balance of anions and cations, d) proteins and lipids, e) lipids and nucleic acids.

6. **Water enters the cell through the membrane by means of:** a) phagocytosis, b) pinocytosis, c) osmosis, d) exocytosis, e) active transport.

7. **The active transport is:** a) flow of substances down the concentration gradient that does not require energy, b) inflow of substances inside the cell against the concentration gradient that requires energy, c) process of engulfing solid particles by the cell membrane and their transfer into cytoplasm, d) process of engulfing liquid particles by the cell membrane and their transfer into cytoplasm, e) water supply of the cell.

8. **The sum of complex organic molecules' segregation reactions is called:** a) diffusion, b) assimilation, c) dissimilation, d) phagocytosis, e) pinocytosis.

9. **Anabolism includes:** a) synthesis of protein and carbohydrates, b) splitting of lipids, c) splitting of carbohydrates, d) splitting of proteins, e) protein, carbohydrate and lipid splitting.

10. **Principles (rules) of chromosomes:** a) constant number, b) pairity, c) individuality, d) continuity, e) all answers are right.

11. **Features of submetacentric chromosomes are:** a) arms of the same length, b) arms of different length, c) one arm is very long while another one is very short, d) one arm is absent, e) all answers are false.

12. **Every chromosome is divided into 2 chromatids during:** a) anaphase, b) telophase, c) prophase, d) metaphase, e) interphase.

13. **Content of genetic material in the cell during the metaphase of mitosis:** a) $2n2chr$, b) $1n2chr$, c) $2n1chr$, d) $1n1chr$, e) $1n4chr$.

14. **During what phase of meiosis crossing-over occurs?** a) prophase I, b) prophase II, c) metaphase I, d) telophase I, e) interkinesis.

15. **Content of genetic material at each pole of the cell during the anaphase of meiosis II is:** a) $2n2chr$, b) $1n2chr$, c) $2n1chr$, d) $1n1chr$, e) $2n4chr$.

II. Complete these statements and write your answers in the table:

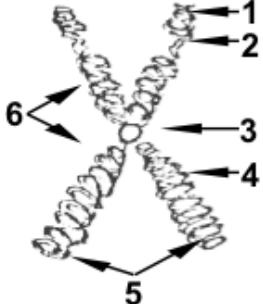
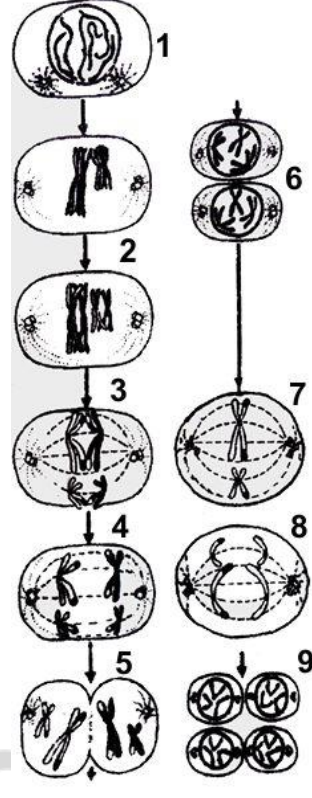
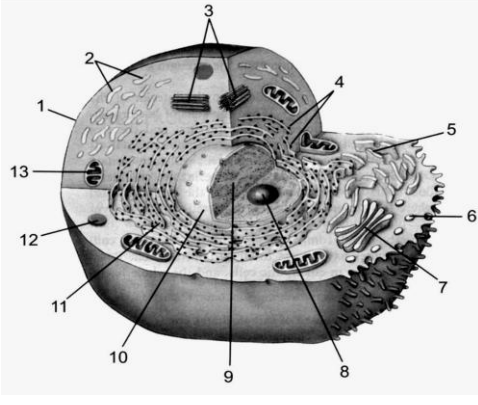
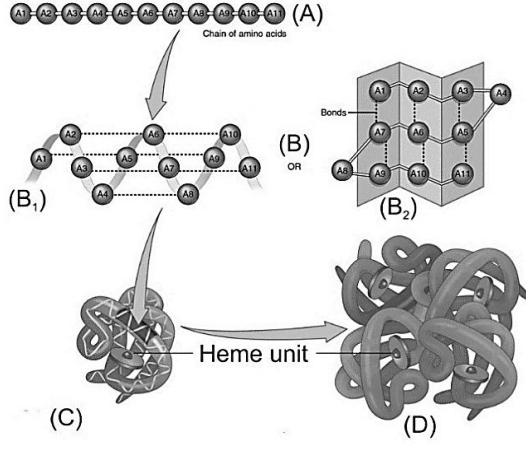
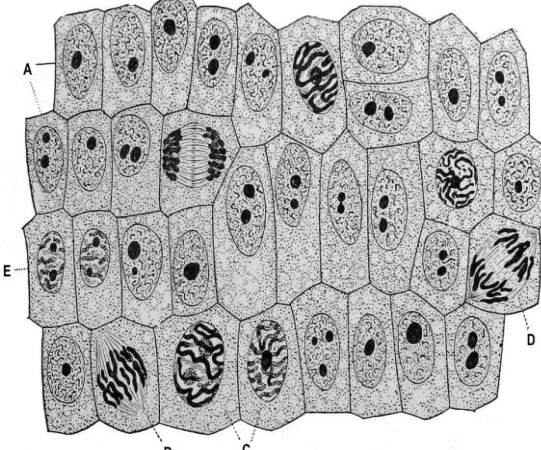
16. Science that deals with structure and living process of the cell is ...

17. Osmosis and facilitated diffusion are examples of ...

18. Chromosomes that have arms of same length is called ...

19. Somatic cells divide by...

III. Write the answers for the questions to the table:

	
<p>20. What is indicated with «4» in the figure?</p>	<p>22. What are the stages when the complement of genetic material is 1n 2chr?</p>
	
<p>21. What is indicated with «1» in the figure?</p>	<p>24. What bounds form the structure «B»?</p>
	<p>23. What is the letter designating the cell that undergoes metaphase?</p>

IV. Answer the question in writing form:

25. Properties of living things.

TOPIC 2. CONTROL CLASS ON SUBJECT «FUNDAMENTALS OF GENETICS»

TEST № 1

I. Select the letter of the correct answer and write it in the table:

1. **Genetics is the science that studies:** a) laws of heredity, b) laws of variability, c) mechanisms of heredity, d) mechanisms of variability, e) all answers are right.
2. **Bonds between thymine and adenine are:** a) 2 hydrogen bonds, b) 3 hydrogen bonds, c) 4 hydrogen bonds, d) 1 hydrogen bond, e) 5 hydrogen bonds.
3. **The basic laws of traits inheritance have been described by:** a) R. Hooke, b) T. Schwann, c) G. Mendel, d) T. Morgan, e) R. Pennet
4. **In humans brown eyes dominate blue eyes. Determine the possible genotypes of children when parents are heterozygous:** a) AA, Aa, b) Aa, c) AA, Aa, aa, d) Aa, aa, e) AA, aa.
5. **A crossing is called dihybrid when parental cells:** a) belong to the same species, b) contain dominant genes, c) vary on 1 pair of alternative characters, d) vary on two pairs of alternative characters, e) contain recessive genes.
6. **Hypothesis of Purity of Gametes states that:** a) genes in hybrids are not mixed and are in a pure allele state, b) genes in hybrids mix, c) after meiosis each gamete receives two genes from each pair, d) after meiosis all chromosomes get to the same gamete, e) all answers are right.
7. **The law of linked inheritance was discovered by:** a) Mendel, b) Morgan, c) Darwin, d) Boveri, e) Schwann.
8. **In case of linked inheritance, female Drosophila with genotype AB//ab could produce gametes:** a) AB, Ab, aB, ab, b) AB, ab, c) Ab, aB, d) AB, Ab, ab, e) Aa, Bb.
9. **Autosomes are:** a) chromosomes of the male body, b) chromosomes of the female body, c) chromosomes of gametes, d) chromosomes that are always same for males and females, e) gametes.
10. **Phenotype is based on:** a) genotype under and environmental conditions, b) genotype and the influence of evolution, c) genotype and the influence of physiological factors, d) genotype, e) adaptation.
11. **Human Genetics studies:** a) normal human karyotype, b) human karyotype in various diseases, c) causes of inherited diseases, d) diagnosis of genetic diseases, e) all answers are right.
12. **Genealogical method allows to determine:** a) the number of chromosomes and their structures, b) metabolic diseases, c) if a certain trait is hereditary, d) sex of organism, e) content of enzymes in the body.
13. **Examples of chromosomal mutations in humans:** a) cat's cry syndrome, b) Down syndrome, c) Shereshevsky-Turner syndrome, d) Klinefelter syndrome, e) phenylketonuria.

II. Complete these statements and write your answers in the table:

14. A triplet of nucleotides coding for an amino acid is called ...
15. Organism is called ... when one gene is dominant and another gene is recessive in its genotype.

16. Female *Drosophila* have ... genetic linkage .
17. A complex of morphological, physiological, biochemical traits that determine the reproduction an organism is its ...
18. Limits of a modification are determined by ...
19. Sex of organism could be determined by ... method.

III. Solve these problems and write your answer to the table:

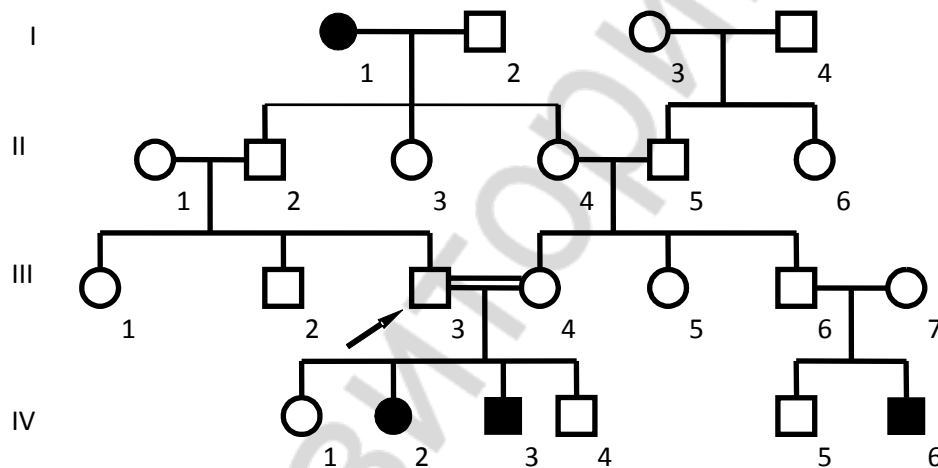
20. How many and what types of gametes could be formed by the organism with the genotype: **AabbDdCc**

21. Recessive gene of hemophilia is located in the X-chromosome. The girl's father was a hemophiliac. Her mother is healthy and has no cases of hemophilia in the family history. This girl married a healthy man. How many (%) their sons would be sick?

22. A gene of yellow seeds of pea dominates over the gene of green seeds while a gene of smooth seeds dominates over the gene of wrinkled seeds. What percentage of green wrinkled seeds could be expected from the cross of two individuals that are heterozygous for both traits?

23. How many and what types of gametes would be formed by the female fruit fly (*Drosophila melanogaster*) with the genotype $\frac{AB}{ab}$ if the distance between the genes is 18 centimorgans?

24. What is the inheritance type in this case? What is the proband's genotype?



IV. Answer the question in writing form:

25. Difference between DNA and RNA.

TEST № 2

I. Select the letter of the correct answer and write it in the table:

1. Heredity is a property of living organisms: a) to hand over their own characteristics and features to further generations, b) acquire new characteristics and features, c) to differ from their brothers and sisters, d) to differ from their parents, e) to lose features.

2. A complex of hereditary a species is: a) genotype, b) genome, c) genofond (gene pool), d) karyotype, e) phenotype.

3. A feature which manifest in both homozygous and heterozygous states is: a) recessive, b) dominant, c) homozygous, d) heterozygous, e) alternative.

4. Segregation ratio on phenotype in the dihybrid cross of heterozygous (complete dominance) is: a) 1 : 2 : 1, b) 1 : 1, c) 9 : 3 : 3 : 1, d) 3 : 1, e) 13 : 3.

5. Linkage group is a: a) diploid chromosome set, b) group of genes characteristic of a pair of homologous chromosomes, c) number of genes in a chromosome, d) genes of all chromosomes, e) all genes of organisms.

6. Morgan's experiments show that segregation of traits when incomplete linkage of genes occurs is: a) BbVv-25%, Bbv-25%, bbVv-25%, bbv-25%, b) BbVv-41,5%, Bbv-8,5%, bbVv-8,5%, bbv-41,5%, c) BbVv-20%, Bbv-30%, bbVv-25%, bbv-25%, d) BbVv-40%, Bbv-10%, bbVv-10%, bbv-40%, e) BbVv-15%, Bbv-15%, bbVv-35%, bbv-35%.

7. Gonosomes or sex chromosomes are: a) chromosomes of the male body, b) chromosomes of the female body, c) chromosomes that differentiate male and female organisms, d) chromosomes of gametes, e) the first pair of chromosomes.

8. Autosomes are: a) chromosomes of the male body, b) chromosomes of the female body, c) chromosomes of gametes, d) same chromosome pairs in the male and female organisms, e) gametes.

9. Adaptation of organism to the environment is: a) mutation, b) modification, c) narrow reaction norm, d) wide reaction norm, e) combinative variability.

10. Hemophilia and albinism are: a) genome mutations, b) gene mutations, c) chromosomal mutations, d) modification, e) combination of genes.

11. Difficulties of human Genetics are: a) many chromosomes, b) few descendants, c) impossible to conduct experiments on humans, d) impossible to create the same conditions, e) all answers are right.

12. Biochemical method determines: a) the number of chromosomes and their structures, b) sex of organism, c) metabolic diseases, d) if a certain trait is hereditary, e) probability of hereditary disease in descendants.

13. Down syndrome is caused by: a) changes in the structure of the DNA molecule, b) changes in chromosome structure, c) extra 21st chromosome, d) change in the number of sex chromosomes, e) all answers are wrong.

II. Complete these statements and write your answers in the table:

14. The nucleotides of DNA strands are connected by ... bonds.

15. The cytological basis of Mendel's laws is explained by the hypothesis of ...

16. Male *Drosophila* have ... linkage of genes.

17. The child's sex is determined at the moment when ... is formed.
18. Property of descendants to differ from their parents is ...
19. Method of comparison and analysis of genealogy is ... method

III. Solve these problems and write your answer to the table:

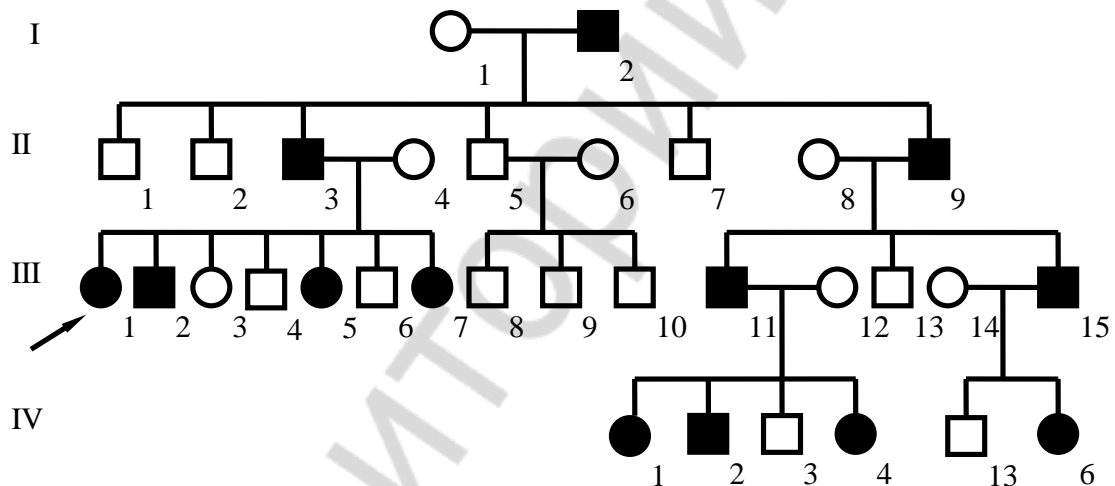
20. How many and what types of gametes could be formed by the organism with the genotype: **AaBbEe**?

21. Recessive gene of hemophilia is located in the X-chromosome. The girl's father was a hemophiliac. Her mother is healthy and there were no cases of hemophilia in mother's family. This girl married a healthy man. How many (%) their daughters would be sick?

22. Gene for yellow seed of peas dominates over the gene for green while a gene for smooth seed dominates over the gene for wrinkled seed surface. What percentage of yellow smooth seeds could be expected from the cross of two individuals heterozygous for both traits?

23. How many and what types of gametes would be formed by the female fruit fly (*Drosophila melanogaster*) with the genotype $\frac{AB}{ab}$ if the distance between the genes is 33 centimorgans?

24. What is the inheritance type in this case? What is the proband's genotype?



IV. Answer the question in writing form:

25. Types and functions of RNA.

TEST № 3

I. Select the letter of the correct answer and write it in the table:

1. **Types of nucleic acids:** a) DNA and ATP, b) RNA and ATP, c) DNA and RNA, d) amino acids and RNA, e) amino acids and DNA.

2. **Amino acids are linked together into a peptide molecule in:** a) small ribosomal subunit, b) large ribosomal subunit, c) centrosome, d) plastids, e) mitochondria.

3. **A complex of all features and properties of organisms:** a) genotype, b) phenotype, c) gene, d) hybrid, e) phene.

4. **Specifics of the Mendel's laws:** a) universality (generality), b) explain mechanisms of inheritance of alternative characters in all living organisms, c) have a statistical nature, d) laws work on a large number of organisms and allow to determine the probability of a particular trait in descendant, e) all answers are right.

5. **Allelic genes are located in:** a) non-homologous chromosomes, b) one arm of a chromosome, c) sex chromosomes, d) autosomes, e) the same loci of homologous chromosomes.

6. **A linkage group is a:** a) diploid chromosome set, b) group of genes of a pair of homologous chromosomes, c) number of genes in chromosome, d) genes of all chromosomes, e) all genes of organisms.

7. **If genes are linked, female of Drosophila with genotype AB//ab could produce gametes:** a) AB, Ab, aB, ab, b) AB, ab, c) Ab, aB, d) AB, Ab, ab, e) Aa, Bb.

8. **Human karyotype has:** a) 48 chromosomes, b) 6 chromosomes, c) 46 chromosomes, d) 42 chromosomes, e) 22 chromosomes.

9. **Mutations that change the chromosome structure are:** a) genome mutations, b) chromosomal mutations, c) gene mutations, d) modification, e) norm of reaction.

10. **Examples of modification:** a) thick coat of animals in cold climates, b) different eye color, c) different hair color, d) pea seed color, e) hemophilia.

11. **Methods of human Genetics:** a) cytogenetic, biochemical, b) biochemical only, c) genealogical, hybridological, d) practical, e) a + b + c.

12. **The main tasks of genetic counseling are:** a) counseling of families and patients with infectious pathology, b) advising of all patients, c) to determine the degree of genetic risk to have an affected child, d) surgical repair of malformations, e) all the answers are wrong.

13. **Shereshevsky-Turner syndrome is caused by:** a) changes in the structure of the DNA molecule, b) changes in chromosome structure, c) changes in the number of autosomes, d) absence of the second sex chromosome, e) all the answers are wrong.

II. Complete these statements and write your answers in the table:

14. The molecule of RNA contains sugar ... instead of deoxyribose.

15. Features that exclude each other are...

16. Alleles of different genes assort independently of one another during gamete formation. It is ... Mendel's law.

17. Fusion of gametes in order to form a zygote is called ...

18. Metabolic diseases could be determined by... method.

19. The results of 1st Morgan's experiment confirmed the ... Mendel's law

III. Solve these problems and write your answer to the table:

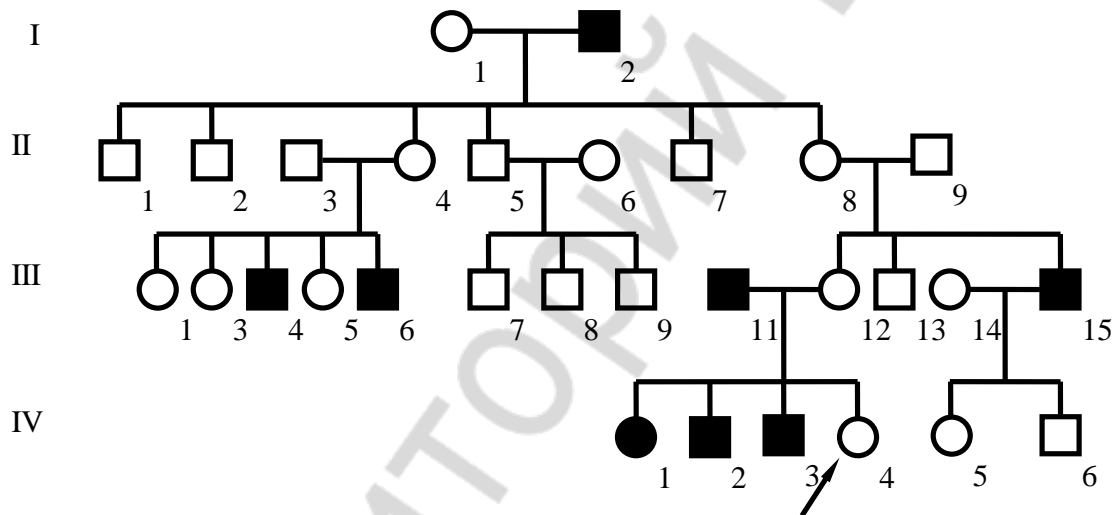
20. How many and what types of gametes could be formed by the organism with the genotype: **AaBbddEe**

21. Recessive gene of hemophilia is located in the X-chromosome. The girl's father was a hemophiliac. Her mother is healthy and there were no cases of hemophilia in mother's family. This girl married a healthy man. How many (%) their sons would be sick?

22. Gene for yellow seed of peas dominates over the gene for green while a gene for smooth seed dominates over the gene for wrinkled seed surface. What percentage of yellow wrinkled seeds could be expected from the cross of two individuals heterozygous for both traits?

23. How many and what types of gametes would be formed by the male fruit fly (*Drosophila melanogaster*) with the genotype $\frac{AB}{ab}$ if the distance between the genes is 18 centimorgans?

24. What is the inheritance type in this case? What is the proband's genotype?



IV. Answer the question in writing form:

25. Mendel's 3th law.

TEST № 4

I. Select the letter of the correct answer and write it in the table:

1. Each nucleotide of DNA contain: a) ribose and nucleotide, b) deoxyribose, nucleotides, phosphoric acid, c) nucleotide, phosphate group, ribose, d) amino acid, deoxyribose, nucleotide, e) adenine, guanine, uracil.

2. DNA is located in: a) plastids and ribosomes, b) cytoplasm and centrosomes, c) nucleus, mitochondria, plastids, d) nucleus and ribosomes, e) Golgi complex and endoplasmic reticulum.

3. The basic laws of inheritance of traits have been described by: a) R. Hooke, b) T. Schwann, c) T. Morgan, d) Mendel, e) L. Punnett.

4. Genes which determine alternative traits are called: a) autosomic, b) allelic, c) homozygous, d) heterozygous, e) non-allelic.

5. How many types of gametes could be produced by organism with genotype AABb? a) 1, b) 2, c) 3, d) 4, e) 8.

6. A crossing-over is an exchange of: a) dominant genes, b) same regions of homologous chromosomes, c) regions of non-homologous chromosomes, d) regions of sex chromosomes, e) recessive genes.

7. Chromosomes of 23rd pair in males are: a) X and X, b) X, X and Y, c) X and Y, d) X, Y and Y, e) X, X and X.

8. Number of autosomes in humans: a) 20 pairs, b) 22 pairs, c) 46 pairs, d) 2 pairs, e) 23 pairs.

9. Mutations that change the structure of the gene are: a) genome mutations, b) chromosomal mutations, c) gene mutations, d) modification, e) adaptation.

10. Norm of reaction is: a) genetic variation, b) range (boundary) of modification, c) result of a combination of parents' genes, d) gametic linkage, e) change in the hereditary material.

11. Method of human Genetics that allows to determine the number of chromosomes and their structure: a) hybridological, b) cytogenetic, c) biochemical, d) genealogical, e) microbiological.

12. Hereditary human diseases caused by sex-linked genes are: a) Down and Klinefelter syndrome, b) hemophilia and daltonism, c) albinism, d) Shereshevsky-Turner syndrome, e) phenylketonuria.

13. Klinefelter syndrome is caused by: a) changes in the structure of the DNA molecule, b) changes in chromosome structure, c) changes in the number of autosomes, d) change in the number of sex chromosomes, e) extra Y-chromosome.

II. Complete these statements and write your answers in the table:

14. A new strand of DNA is formed according to the principle of...

15. The method of cross that was used by Mendel is called...

16. Genes located in the same chromosome are...

17. Genes of hairy ears are located in the chromosome...

18. Method of Genetics that cannot be used in human Genetics is...

19. Types of variation: phenotypic and....

III. Solve these problems and write your answer to the table:

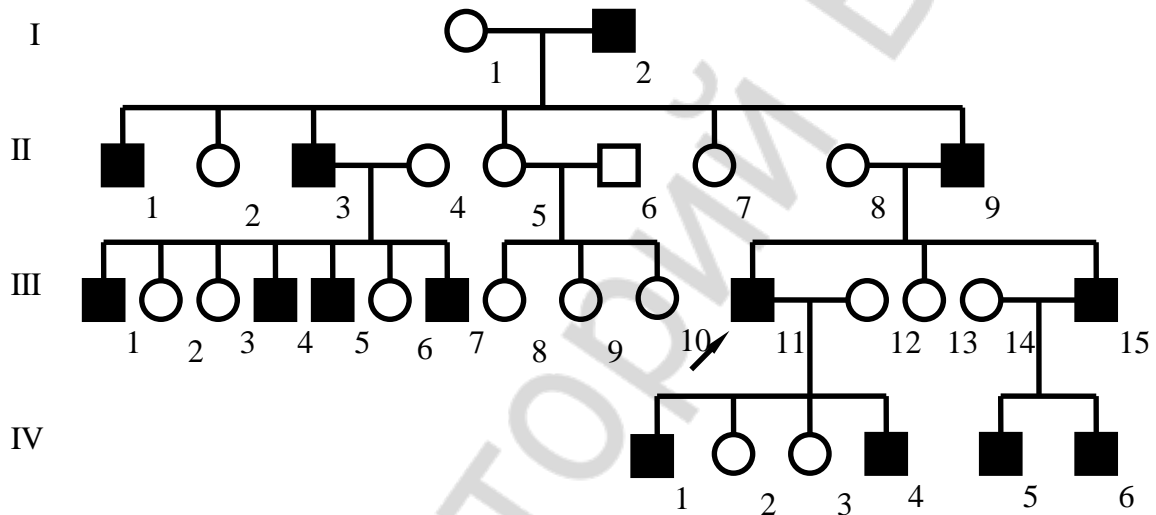
20. How many and what types of gametes could be formed by the organism with the genotype: **AABBccDdEE**

21. In humans brown eyes dominate blue eyes. Blue-eyed female married a brown-eyed heterozygous male. What eye color will their children get?

22. Recessive gene of hemophilia is located in the X-chromosome. The girl's father was a hemophiliac. Her mother is healthy and there were no cases of hemophilia in mother's family. This girl married a healthy man. How many (%) their daughters would be sick?

23. How many and what types of gametes would be formed by the female fruit fly (*Drosophila melanogaster*) with the genotype $\frac{A}{a5}$ if the distance between the genes is 8 centimorgans?

24. What is the inheritance type in this case? What is the proband's genotype?



IV. Answer the question in writing form:

25. Genetic linkage.

TEST № 5

I. Select the letter of the correct answer and write it in the table:

1. **Genetics studies:** a) laws of heredity, b) variability law, c) mechanisms of heredity, d) variability mechanisms, e) all answers are right.

2. **The nucleotides found in the DNA are:** a) adenine and uracil, b) thymine and lysine, c) adenine and guanine, d) uracil and cytosine, e) lysine and adenine.

3. **A complex of hereditary factors of the organisms of the same species is:** a) genotype, b) genome, c) genofond (gene pool), d) karyotype, e) phenotype.

4. **A feature manifested in hybrids in the homozygous and heterozygous states:** a) recessive, b) dominant, c) homozygous, d) heterozygous, e) alternative.

5. **Sense of hypothesis of purity of gametes is that:** a) genes in hybrids are not mixed and stand in a pure allele status, b) genes in hybrids are mixed, c) at meiosis gamete has 2 genes from each pair of genes, d) at meiosis all chromosomes come to one gamete, e) all answers are right.

6. **A crossing-over takes place in:** a) telophase of mitosis, b) prophase I of meiosis, c) anaphase I of meiosis, d) prophase II of meiosis, e) interphase.

7. **A zygote develops into the female organism if the egg-cell was fertilized by the sperm containing:** a) X-chromosome, b) Y- chromosome, c) X- and X- chromosomes, d) X- and Y- chromosomes, e) X-, X- and Y- chromosomes.

8. **Hair color and eye color in humans are determined by genes of:** a) X-chromosome, b) chromosomes of the female body, c) Y-chromosome, d) X- and Y-chromosome, e) autosomes.

9. **Mutations that change the number of chromosomes are:** a) genome mutations, b) chromosomal mutations, c) gene mutations, d) modification, e) norm of reaction.

10. **Change in phenotype without changes in the structure of the genotype is:** a) mutation, b) reaction norm, c) adaptation, d) modification, e) mutagens.

11. **Content of enzymes and amino acids in the body could be determined by the following method:** a) hybridological, b) cytogenetic, c) biochemical, d) genealogical, e) microbiological.

12. **Down syndrome is caused by:** a) changes in the structure of the DNA molecule, b) changes in chromosome structure, c) extra 21nd chromosome, d) change in the number of sex chromosomes, e) all the answers are wrong.

13. **Symptoms of albinism are:** a) mental deficiency, b) milky white skin, c) blue pupil, d) dark hair, e) reduced sensitivity of the skin to ultraviolet rays.

II. Complete these statements and write your answers in the table:

14. Property of filial generations to receive new characteristics and to differ from their parents is...

15. ... square is used to write down gametes and hybrids' genotypes.

16. Sex chromosomes in the male organism are ... and in the female organisms are...

17. Metabolic diseases are caused by ... mutations.

18. Human karyotype is studied by ... method.

19. An important field in the prevention of genetic diseases is ... counseling.

III. Solve these problems and write your answer to the table:

20. How many and what types of gametes could be formed by the organism with the genotype:

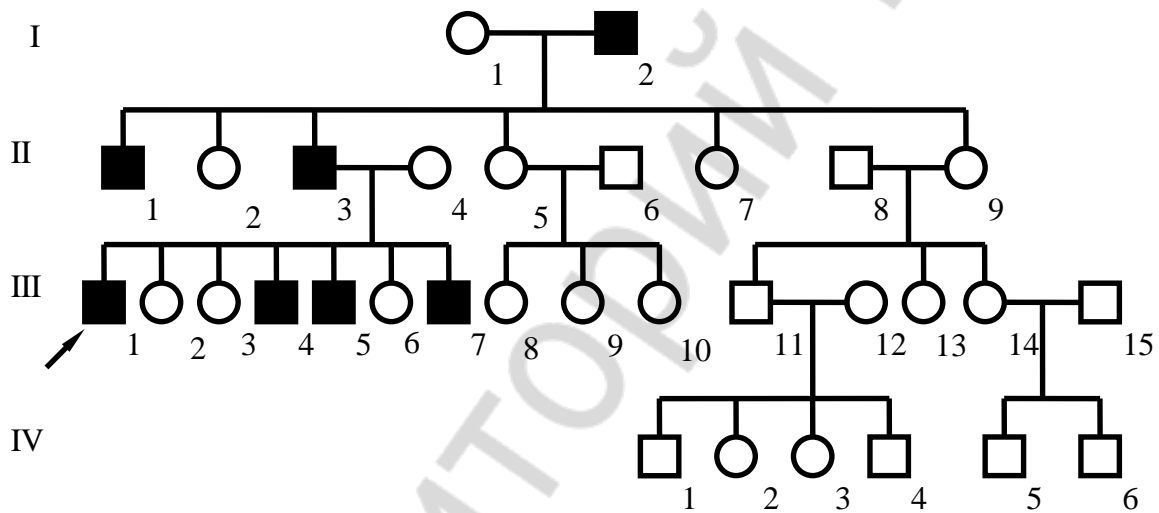
AaCcFF

21. Recessive gene of hemophilia is located in the X-chromosome. The girl's father was a hemophiliac. Her mother is healthy and there were no cases of hemophilia in mother's family. This girl married a healthy man. What is the probability of giving birth to a sick child?

22. In humans brown eyes dominate blue and eyes and dextrality (right-handedness) is dominant over sinistrality (left-handedness). How many brown-eyed left-handed children could be expected if their parents are double-heterozygous?

23. How many and what types of gametes would be formed by the female fruit fly (*Drosophila melanogaster*) with the genotype $\frac{AB}{aB}$ if the distance between the genes is 18 centimorgans?

24. What is the inheritance type in this case? What is the proband's genotype?



IV. Answer the question in writing form:

25. Cell theory.

TEST № 6

I. Select the letter of the correct answer and write it in the table:

1. Each DNA nucleotide contain: a) ribose and nucleotide, b) deoxyribose, nucleotides, phosphoric acid, c) nucleotide, phosphate group, ribose, d) amino acid, deoxyribose, nucleotide, e) adenine, guanine, uracil.

2. According to the 2nd Mendel's law the number of descendants with dominant feature is: a) 50 %, b) 75 %, c) 60 %, d) 30 %, e) 100 %.

3. Organisms that have identical allelic genes in genotype are called: a) heterozygous, b) homozygous, c) recessive, d) dominant, e) autosomic.

4. The 3rd Mendel's law is: a) Law of Dominance, b) Law of Segregation, c) Law of Independent Assortment, d) Hypothesis of Purity of Gametes, e) rules of chromosomes.

5. Morgan's experiments show that segregation of traits when incomplete linkage of genes occurs is next: a) BbVv-25%, Bbv v-25%, bbVv-25%, bbv v-25%, b) BbVv-41,5%, Bbv v-8,5%, bbVv-8,5%, bbv v-41,5%, c) BbVv-20%, Bbv v-30%, bbVv-25%, bbv v-25%, d) BbVv-40%, Bbv v-10%, bbVv-10%, bbv v-40%, e) BbVv-15%, Bbv v-15%, bbVv-35%, bbv v-35%.

6. Germination of sexual organs and sexual characteristics are determined by chromosomes of: a) the first pair, b) 20th pair, c) 22nd pair, d) 23rd pair, e) 21st pair.

7. Chromosomes of 23rd pair in males are: a) X and X, b) X, X and Y, c) X and Y, d) X, Y and Y, e) X, X and X.

8. Adaptation of organism to the environment is: a) mutation, b) modification, c) narrow reaction norm, d) wide reaction norm, e) combinative variability.

9. Change in phenotype caused by changes in the genotype is: a) genotypic variability, b) phenotypic variation, c) reaction norm, d) evolution, e) adaptation.

10. Human Genetics studies: a) normal human karyotype, b) human karyotype in various diseases, c) causes of inherited diseases, d) diagnosis of genetic diseases, e) all answers are right.

11. Genealogical method allows to determine: a) the number of chromosomes and their structures, b) metabolic diseases, c) if a certain trait is hereditary, d) sex of organism, e) content of enzymes in the body.

12. Shereshevsky-Turner syndrome is caused by: a) changes in the structure of the DNA molecule, b) changes in chromosome structure, c) changes in the number of autosomes, d) absence of the second sex chromosome, e) all the answers are wrong.

13. Phenylketonuria is caused by: a) changes in the structure of the DNA molecule, b) changes in chromosome structure, c) violation of conversion of tyrosine into melanin, d) violation of conversion of phenylalanine into tyrosine, e) absence of the second sex chromosome.

II. Complete these statements and write your answers in the table:

14. A group of ribosomes is form a...

15. As a result of experiments Morgan formulated ...theory of heredity.

16. Chromosomes that are the same in the male and female organisms are called...

17. Environmental factors that cause mutation are...
18. Diploid number of chromosomes of somatic cells is...
19. Hereditary human diseases associated with the violation of color vision are..

III. Solve these problems and write your answer to the table:

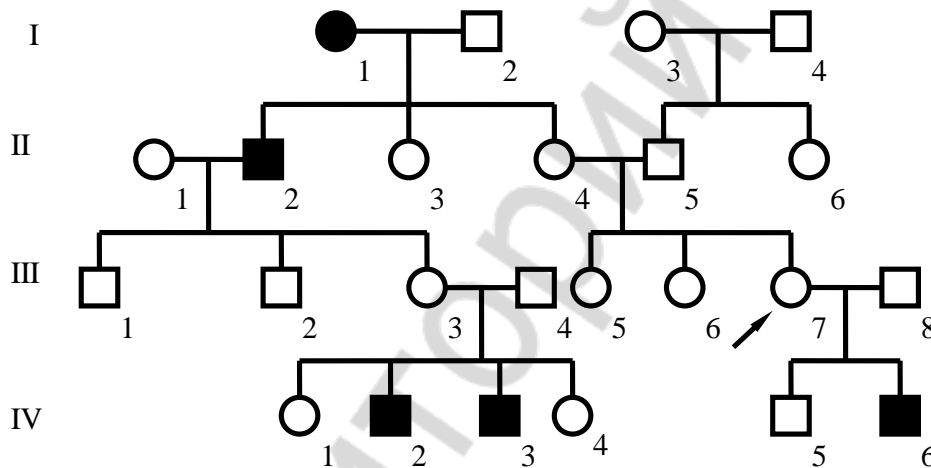
20. How many and what types of gametes could be formed by the organism with the genotype: **DdVVBBcc**

21. Recessive gene of hemophilia is located in the X-chromosome. The girl's father was a hemophiliac. Her mother is healthy and there were no cases of hemophilia in mother's family. This girl married a sick man. What is the probability of giving birth to a sick child?

22. In humans brown eyes are dominant over blue and dextrality (right-handedness) is dominant over sinistrality (left-handedness). How many blue-eyed righty children could be expected if their parents are double-heterozygous?

23. How many and what types of gametes would be formed by the male fruit fly (*Drosophila melanogaster*) with the genotype $\frac{Ab}{ab}$ if the distance between the genes is 16 centimorgans?

24. What is the inheritance type in this case? What is the proband's genotype?



IV. Answer the question in writing form:

25. Forms of variation.

TEST № 7

I. Select the letter of the correct answer and write it in the table:

1. **Types of nucleic acids:** a) DNA and ATP, b) RNA and ATP, c) DNA and RNA, d) amino acids and RNA, e) amino acids and DNA.

2. **Bonds between cytosine and guanine are:** a) 2 hydrogen bonds, b) 3 hydrogen bonds, c) 4 hydrogen bonds, d) 1 hydrogen bond, e) 5 hydrogen bonds.

3. **A complex of all features and properties of organisms:** a) genotype, b) phenotype, c) gene, d) hybrid, e) phene.

4. **Organisms that give several types of gametes and segregate (give disjoining) at crossing:** a) monohybrid, b) dominant, c) homozygous, d) heterozygous, e) recessive.

5. **Allelic genes are located in:** a) non-homologous chromosomes, b) homologous chromosomes, c) sex chromosomes, d) autosomes, e) same loci of homologous chromosomes.

6. **At crossing of organisms with genotype AAbb x aaBB descendant with certain genotype could be produced:** a) AAbb; AaBb; AaBB, b) AaBb, c) AaBB, d) aaBB, e) aabb.

7. **What principles are not applicable to Morgan's chromosome theory of heredity:** a) chromosomes are linear sequences of genes; genes are located in specific sites on chromosomes, b) genes of a pair of homologous chromosomes form a linkage group, c) the number of linkage group correspond to haploid chromosome set, d) abnormality (disorder) in linkage of genes is a result of crossing-over in prophase I of meiosis, e) linkage of genes is always complete.

8. **Number of autosomes in humans:** a) 20 pairs, b) 22 pairs, c) 46 pairs, d) 2 pairs, e) 23 pairs.

9. **A zygote develop into the male individual if the egg-cell was fertilized by the sperm containing:** a) X-chromosome, b) Y-chromosome, c) X- and X-chromosomes, d) X- and Y-chromosomes, e) X-, X- and Y-chromosomes.

10. **Mutations that alter the structure of the gene are:** a) genome mutations, b) chromosomal mutations, c) gene mutations, d) modification, e) adaptation.

11. **Difficulties of human Genetics are:** a) many chromosomes, b) few descendants, c) impossible to conduct experiments on humans, d) impossible to create the same conditions, e) all answers are right.

12. **Cytogenetic method allows to determine:** a) metabolic diseases, b) the number of chromosomes and their structures, c) content of enzymes, d) content of amino acids, e) probability of hereditary disease in descendants.

13. **Hereditary human diseases caused by sex-linked genes:** a) Down and Klinefelter syndrome, b) hemophilia and daltonism, c) albinism, d) Shereshevsky-Turner syndrome, e) phenylketonuria.

II. Complete these statements and write your answers in the table:

14. The molecule of RNA contains ... instead of thymine.

15. The basic laws of inheritance of traits have been described by...

16. Genes of body color and length of wings are located in ... chromosome.

17. Genes of hemophilia and daltonism are located in the chromosome...

18. A table used for writing down gametes and hybrid genotype is called ... square.

19. Types of variation: phenotypic and....

III. Solve these problems and write your answer to the table:

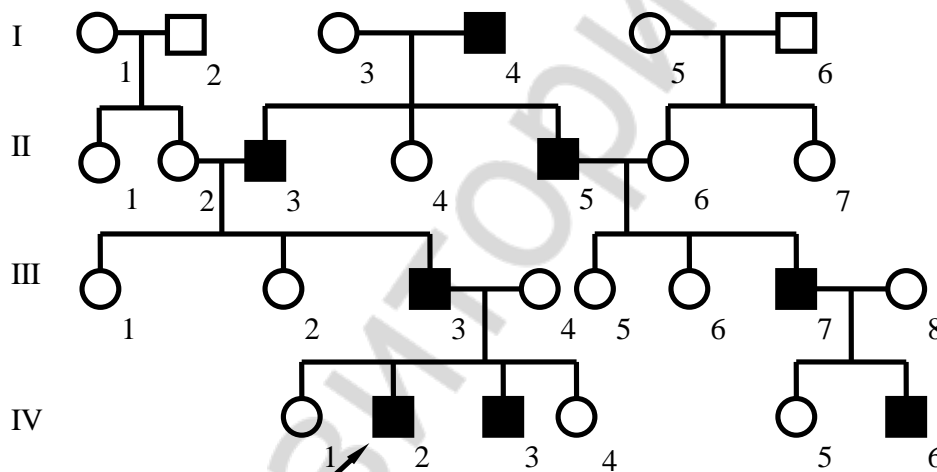
20. How many and what types of gametes could be formed by the organism with the genotype: **AabbddvvGg**

21. Recessive gene of hemophilia is located in the X-chromosome. The girl's father was a hemophiliac. Her mother is healthy and there were no cases of hemophilia in mother's family. This girl married a sick man. How many (%) their sons would be sick?

22. In humans brown eyes are dominant over blue eyes and dextrality (right-handedness) is dominant over sinistrality (left-handedness). How many children with one recessive trait could be expected if their parents are double-heterozygous?

23. How many and what types of gametes would be formed by the female fruit fly (*Drosophila melanogaster*) with the genotype $\frac{AB}{ab}$ if the distance between the genes is 36 centimorgans?

24. What is the inheritance type in this case? What is the proband's genotype?



IV. Answer the question in writing form:

25. Classification of mutations.

TEST № 8

I. Select the letter of the correct answer and write it in the table:

1. **DNA is located in:** a) plastids and ribosomes, b) cytoplasm and centrosomes, c) nucleus, mitochondria, plastids, d) nucleus and ribosomes, e) Golgi complex and endoplasmic reticulum.

2. **Bonds between thymine and adenine are:** a) 2 hydrogen bonds, b) 3 hydrogen bonds, c) 4 hydrogen bonds, d) 1 hydrogen bond, e) 5 hydrogen bonds.

3. **Organisms that give several types of gametes and segregate at crossing:** a) monohybrid, b) dominant, c) homozygous, d) heterozygous, e) recessive.

4. **The cross is monohybrid when parent cells:** a) belong to the same species, b) contain recessive genes, c) vary on one pair of alternative characters, d) vary on two pairs of alternative characters, e) contain dominant genes.

5. **Segregation of phenotypes in the dihybrid cross of heterozygous under complete dominance is following:** a) 1 : 2 : 1, b) 1 : 1, c) 9 : 3 : 3 : 1, d) 3 : 1, e) 13 : 3.

6. **Specifics of the Mendel's laws:** a) universality (generality), b) explain mechanisms of inheritance of alternative characters in all living organisms, c) have a statistical nature, d) laws work on a large number of organisms and allow to determine the probability of a particular trait in descendant, e) all answers are right.

7. **Chromosome theory of inheritance was formulated by:** a) Mendel, b) Morgan, c) Darwin, d) Boveri, e) Schwann.

8. **Hair color and eye color in humans are determined by genes of:** a) X-chromosome, b) chromosomes of the female body, c) Y-chromosome, d) X- and Y-chromosome, e) autosomes.

9. **A zygote develop into the male body if the egg-cell was fertilized by the sperm containing:** a) X-chromosome, b) Y-chromosome, c) X- and X- chromosomes, d) X- and Y-chromosomes, e) X-, X- and Y-chromosomes.

10. **Examples of modification:** a) thick coat of animals in cold climates, b) different eye color, c) different hair color, d) pea seed color, e) hemophilia.

11. **Mutations that alter the chromosome structure are:** a) genome mutations, b) chromosomal mutations, c) gene mutations, d) modification, e) norm of reaction.

12. **Biochemical method determines:** a) the number of chromosomes and their structures, b) sex of organism, c) metabolic diseases, d) if a certain trait is hereditary, e) probability of hereditary disease in descendants.

13. **The main tasks of genetic counseling are:** a) counseling of families and patients with infectious pathology, b) advising of all patients, c) to determine the degree of genetic risk to have an affected child, d) surgical repair of malformations, e) all the answers are wrong.

II. Complete these statements and write your answers in the table:

14. Due to variability organisms can ... to their environment.

15. A ...trait couldn't appear in the presence of a dominant gene.

16. Chromosomes that are different in the male and female organisms are called...

17. Linkage of genes was discovered by...

18. Hemophilia always occurs in men because a male organism has ... X-chromosome.

19. Hereditary human diseases when phenylpyruvic acid is accumulated in the body is called...

III. Solve these problems and write your answer to the table:

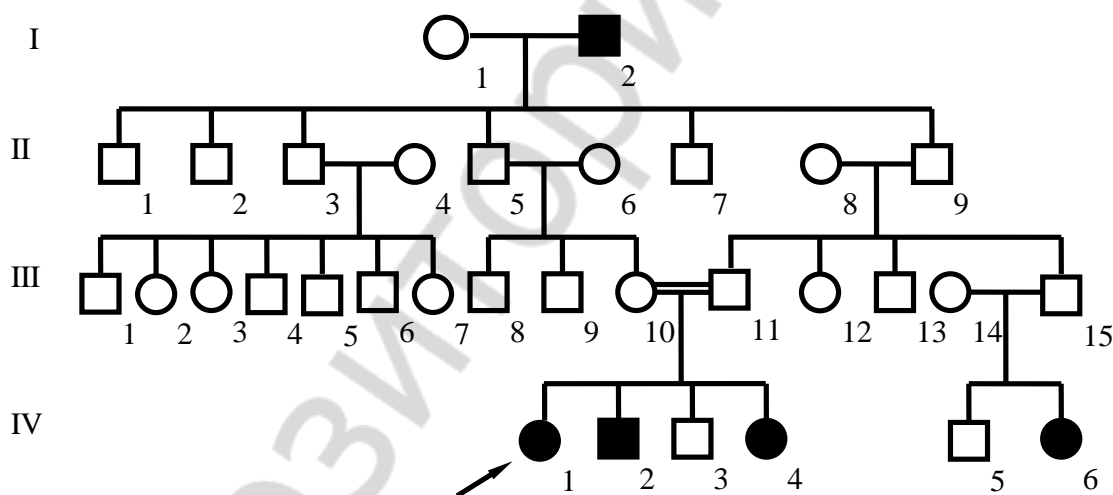
20. How many and what types of gametes could be formed by the organism with the genotype: **EeHhDDaa**

21. Recessive gene of hemophilia is located in the X-chromosome. The girl's father was a hemophiliac. Her mother is healthy and there were no cases of hemophilia in mother's family. This girl married a sick man. How many (%) their daughters would be sick?

22. In humans brown eyes are dominant over blue eyes and dextrality (right-handedness) is dominant over sinistrality (left-handedness). How many children with both recessive traits could be expected if their parents are double-heterozygous?

23. How many and what types of gametes would be formed by the male fruit fly (*Drosophila melanogaster*) with the genotype $\frac{Ab}{ab}$ if the distance between the genes is 36 centimorgans?

24. What is the inheritance type in this case? What is the proband's genotype?



IV. Answer the question in writing form:

25. Basic designations used for making the family tree.

TEST № 9

I. Select the letter of the correct answer and write it in the table:

1. 1 amino acid in molecule of polypeptide is determined by: a) 2 nucleotides, b) 3 nucleotides, c) 4 nucleotides, d) 1 nucleotide, e) 5 nucleotides.

2. Amino acids are attached to each other into a molecule of peptide in: a) small ribosomal subunit, b) large ribosomal subunit, c) centrosome, d) plastids, e) mitochondria.

3. According to the 2nd Mendel's law the number of descendants with dominant feature is: a) 50 %, b) 75 %, c) 60 %, d) 30 %, e) 100 %.

4. At crossing of organisms with genotype $AAbb \times aaBB$ descendant with certain genotype could be produced: a) $AAbb$; $AaBb$; $AaBB$, b) $AaBb$, c) $AaBB$, d) $aaBB$, e) $aabb$.

5. A crossing is dihybrid when parent cells: a) belong to the same species, b) contain dominant genes, c) vary on 3 pairs of alternative characters, d) vary on two pairs of alternative characters, e) contain recessive genes.

6. The law of linked inheritance was founded by: a) G. Mendel, b) T. Morgan, c) Ch. Darwin, d) Boveri, e) T. Schwann.

7. If inheritance is linked female *Drosophila* with genotype $AB//ab$ could produce gametes: a) AB , Ab , aB , ab , b) AB , ab , c) Ab , aB , d) AB , Ab , ab , e) Aa , Bb .

8. Sex chromosomes are: a) chromosomes of the male body, b) chromosomes of the female body, c) chromosomes that are different in the male and female organisms, d) chromosomes of gametes, e) the first pair of chromosomes.

9. The name of hereditary disease when blood coagulates slowly: a) daltonism, b) influenza, c) hemophilia, d) Down's syndrome, e) hypertension.

10. Phenotype is based on: a) genotype under the influence of environmental conditions, b) genotype under the influence of evolution, c) genotype under the influence of physiological factors, d) genotype, e) adaptation.

11. Mutations that change the number of chromosomes are: a) genome mutations, b) chromosomal mutations, c) gene mutations, d) modification, e) norm of reaction.

12. Content of enzymes and amino acids in the body could be determined by the following method: a) hybridological, b) cytogenetic, c) biochemical, d) genealogical, e) microbiological.

13. Examples of chromosomal mutations in humans: a) cat's cry syndrome, b) Down syndrome, c) Shereshevsky-Turner syndrome, d) Klinefelter syndrome, e) phenylketonuria.

II. Complete these statements and write your answers in the table:

14. The unit of heredity and variability is...

15. An organism which has one dominant gene and one recessive genes is called ...

16. All genes of a pair of homologous chromosomes is the ... of linkage

17. Method of Genetics that cannot be used in human Genetics is ...

18. The adaptation of organisms to environmental conditions is ...

19. A complex of morphological, physiological, biochemical traits that determine a reproduction of organisms is...

III. Solve these problems and write your answer to the table:

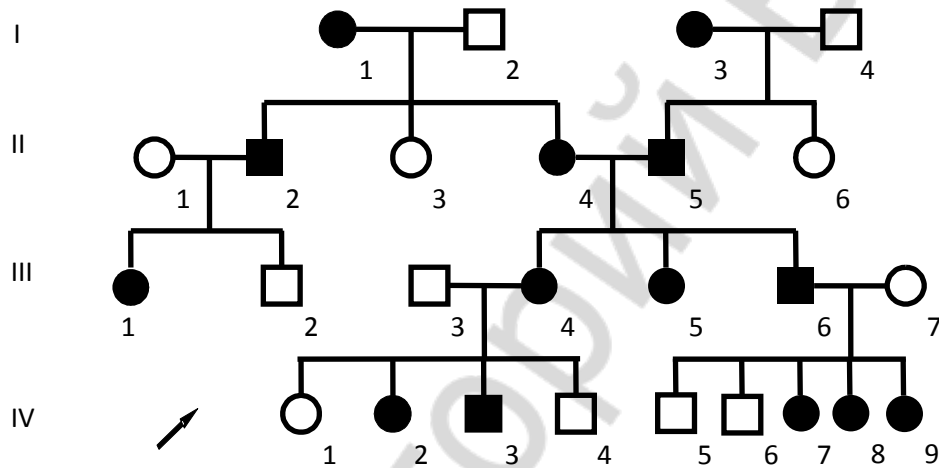
20. How many and what types of gametes could be formed by the organism with the genotype: **AABBccHh**

21. Recessive gene of hemophilia is located in the X-chromosome. The girl's father was a hemophiliac. Her mother is healthy and there were no cases of hemophilia in mother's family. This girl married a sick man. How many (%) their sons would be sick?

22. In humans brown eyes are dominant over blue and dextrality (right-handedness) is dominant over sinistrality (left-handedness). How many children with one dominant trait could be expected if their parents are double-heterozygous?

23. How many and what types of gametes would be formed by the male fruit fly (*Drosophila melanogaster*) with the genotype $\frac{AB}{ab}$ if the distance between the genes is 28 centimorgans?

24. What is the inheritance type in this case? What is the proband's genotype?



IV. Answer the question in writing form:

25. Characteristic of the genetic prognosis stages.

TEST № 10

I. Select the letter of the correct answer and write it in the table:

1. Heredity is a property of living organisms: a) to breed true, to hand on their own characteristics and features of development to further descendants, b) to hand on new characteristics and feature, c) to differ from their brothers and sisters, d) to differ from their parents, e) to receive new features.

2. Stages of protein synthesis are: a) replication and transcription, b) translation and replication, c) crossing-over and transcription, d) transcription and translation, e) synapsis and translation.

3. In humans brown eyes are dominant over blue eyes. Determine the possible children's genotypes when parents both are brown-eyed heterozygous: a) AA, Aa, b) Aa, c) AA, Aa, aa, d) Aa, aa, e) AA, aa.

4. How many types of gametes could an organism with genotype Aa form?: a) 1, b) 2, c) 3, d) 4, e) 5.

5. How many types of gametes could be produced by the organism with genotype AABb? a) 1, b) 2, c) 3, d) 4, e) 8.

6. A Crossing-over take place in: a) telophase of mitosis, b) prophase I of meiosis, c) anaphase I of meiosis, d) prophase II of meiosis, e) interphase.

7. What principles are not applicable to Morgan's chromosome theory of heredity: a) chromosomes are linear sequences of genes; genes are located in specific sites on chromosomes, b) genes of a pair of homologous chromosomes form a linkage group, c) the number of linkage group correspond to haploid chromosome set, d) abnormality (disorder) in linkage of genes is a result of crossing-over in prophase I of meiosis, e) linkage of genes is always complete.

8. Germination of sexual organs and sexual characteristics are determined by chromosomes of: a) the first pair, b) 20th pair, c) 22nd pair, d) 23rd pair, e) 21st pair.

9. The name of hereditary disease when the human eyes cannot distinguish colors: a) daltonism, b) influenza, c) hemophilia, d) Down's syndrome, e) anophthalmia.

10. Norm of reaction is: a) genetic variation, b) range (boundary) of modification, c) result of a combination of parents' genes, d) gametic linkage, e) change in the hereditary material.

11. Hemophilia and albinism are: a) genome mutations, b) gene mutations, c) chromosomal mutations, d) modification, e) combination of genes.

12. Cytogenetic method allows to determine: a) metabolic diseases, b) the number of chromosomes and their structures, c) content of enzymes, d) content of amino acids, e) probability of hereditary disease in descendants.

13. Klinefelter syndrome is caused by: a) changes in the structure of the DNA molecule, b) changes in chromosome structure, c) changes in the number of autosomes, d) change in the number of sex chromosomes, e) extra Y-chromosome.

II. Complete these statements and write your answers in the table:

14. Amino acids are transported from cytoplasm to ribosomes by...

15. Features that exclude each other are

16. Property of descendants to differ from their parents is...

17. An important field in the prevention of genetic diseases is counseling.
 18. Sex chromosomes in the male organism are ... and in the female organisms are...
 19. The cytological basis of the Mendel's law is explained by hypothesis of....

III. Solve these problems and write your answer to the table:

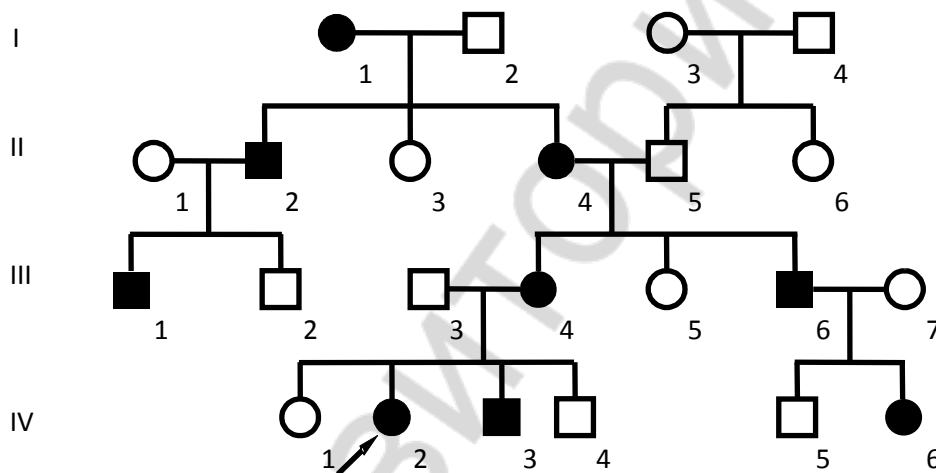
20. How many and what types of gametes could be formed by the organism with the genotype: **EeMMAabb**

21. Recessive gene of hemophilia is located in the X-chromosome. The girl's father was a hemophiliac. Her mother is healthy and there were no cases of hemophilia in mother's family. This girl married a sick man. What is the probability of giving birth to a healthy child?

22. In humans brown eyes are dominant over blue and dextrality (right-handedness) is dominant over sinistrality (left-handedness). How many children with both dominant traits could be expected if their parents are double-heterozygous?

23. How many and what types of gametes would be formed by the female fruit fly (*Drosophila melanogaster*) with the genotype $\frac{AB}{ab}$ if the distance between the genes is 15 centimorgans?

24. What is the most probable inheritance type in this case? What is the proband's genotype?



IV. Answer the question in writing form:

25. Hereditary human diseases.

**TOPIC 3. CONTROL CLASS ON SUBJECT
«HUMAN ANATOMY»**

TEST № 1

I. Select the letter of the correct answer and write it in the table:

1. Human bodies consist of tissues: a) epithelial and strengthening, b) muscular and conductive, c) nervous and connective, d) connective and excretive, e) meristem, connective and nervous.

2. A diaphragm consists of: a) muscular and epithelial, b) muscular, c) connective, muscular and nervous, d) nervous and muscular, e) epithelial and connective.

3. In form bones could be: a) flat and tubular, b) triangular, c) quadratic, d) round, e) oval.

4. A pelvic girdle consists of: a) one pelvic bone that is accreted with sacral spine, b) one pelvic bone that isn't accreted with sacral spine, c) pelvic and femoral bones, d) two pelvic bones that are accreted with sacral spine, e) two pelvic bones that aren't accreted with sacral spine.

5. Muscle of the heart consists of: a) smooth muscular tissue, b) striated muscular tissue, c) smooth and striated muscular tissue, d) striated muscular tissue with a special structure, e) smooth and striated muscular tissue with a special structure.

6. Function of platelets: a) transport, b) energetic, c) protective, d) regulatory, e) participate in blood coagulation.

7. Myocardium consists of tissue: a) connective, b) muscular, c) connective tissue covered by epithelium, d) epithelial, e) muscular tissue covered by epithelium.

8. A pulmonary circulation: a) begins from the left ventricle and ends in the left atrium, b) begins from the right ventricle and ends in the left atrium, c) begins from the left ventricle and ends in the right atrium, d) begins from the right ventricle and ends in the right atrium, e) begins from the left ventricle and ends in the right atrium.

9. Epithelium of nasal cavity contains: a) glands, b) blood capillaries, c) blood capillaries and glands, d) cilia, glands, e) cilia, glands and blood capillaries.

10. Secondary urine is produced in: a) capsule of nephron by filtration of blood plasma, b) tubule of nephron by filtration of blood plasma, c) tubule of nephron by reabsorption, d) capsule of nephron by reabsorption, e) pelvis by filtration of blood plasma.

11. The spine has lengths of: a) 41–45 sm, b) 41–45 mm, c) 21–25 sm, d) 10–15 sm, e) 0,5–1 m.

12. Muscular tonus is regulated by: a) mesencephalon, b) cerebellum, c) medulla oblongata, d) diencephalon, e) telencephalon.

13. The largest number of photoreceptors is in: a) yellow spot, b) blind spot, c) choroid, d) iris, e) cornea.

14. Auditory receptors are located on the: a) basilar membrane, b) tectorial membrane, c) drum (tympanic) membrane, d) external auditory canal (meatus), e) membrane of oval window.

15. During the period of formation cells: a) are divided by mitosis, b) increase in size, c) are divided by meiosis, d) produce gametes of a certain shape, e) divide by amitosis.

II. Complete these statements and write your answers in the table:

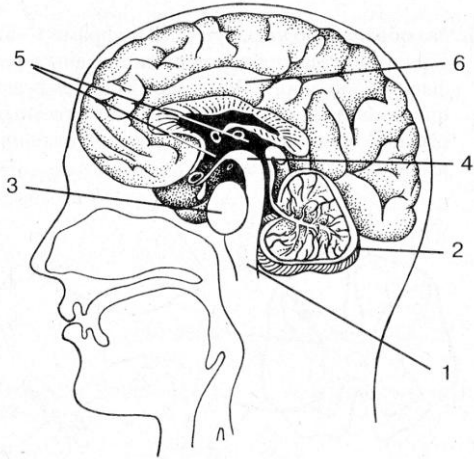
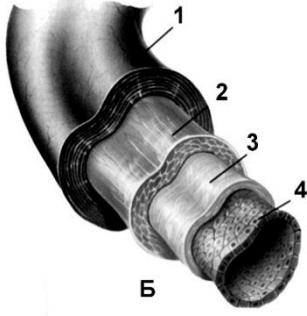
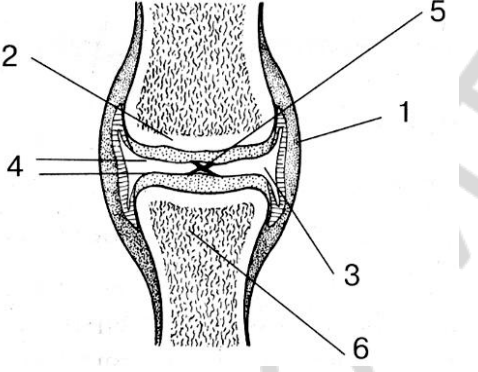
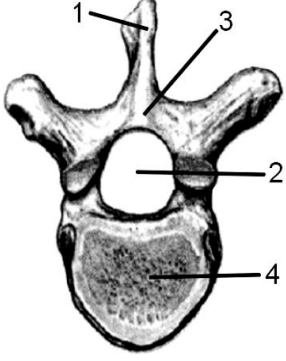
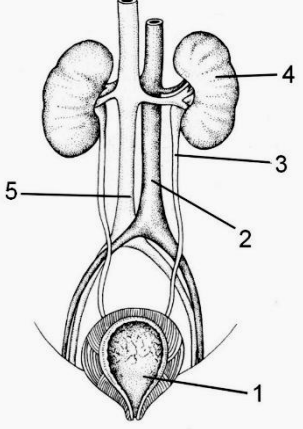
16. Immovable bone conjunction of small pelvis consists of... bones

17. Carpal, metacarpal bones and phalanges of the fingers form...

18. ... muscles tire slowly.

19. The function of gas exchange is performed by...

III. Write the answers for the questions to the table:

		
<p>20. What is indicated with «1» in the figure?</p>	<p>21. What is indicated with «2» in the figure?</p>	
		
<p>22. What is indicated with «1» in the figure?</p>	<p>23. What is indicated with «4» in the figure?</p>	<p>24. What is indicated with «4» in the figure?</p>

IV. Answer the question in writing form:

25. The structure of a tooth.

TEST № 2

I. Select the letter of the correct answer and write it in the table:

1. Muscular tissue comprises: a) skeletal muscles and skin, b) skin and muscles of internal organs, c) brain and skeletal muscles, d) spinal cord and skeletal muscles, e) skeletal muscles and muscles of internal organs.

2. A thoracic spine contains vertebrae: a) 11, b) 5, c) 7, d) 12, e) 10.

3. A reflex arc consists of: a) receptor, interneuron, b) afferent neuron, interneuron, working organ c) receptor, afferent neuron, interneuron, efferent neuron, working organ, d) efferent neuron, working organ, e) receptor, efferent neuron, interneuron, working organ.

4. Red blood cells are formed in: a) yellow marrow, b) red marrow, c) spleen, d) lymph nodes, e) spleen and red marrow.

5. Pericardium consists of tissue: a) muscular, b) epithelial, c) connective, d) connective and epithelial, e) connective and muscular.

6. Right heart contains: a) venous blood only, b) arterial blood only, c) venous and arterial blood, d) mixed blood, e) mixed, venous and arterial blood.

7. In respiratory movements participate: a) intercostal muscles and the pelvic floor muscles, b) intercostal muscles and diaphragm, c) diaphragm and the muscles of the shoulder girdle, d) diaphragm and back muscles, e) intercostal muscles and muscles of the upper extremities.

8. Collecting tubules open into: a) bladder, b) ureter, c) pelvis, d) urethra, e) capsule of nephron.

9. What is in the spinal canal? a) joint fluid, b) spinal fluid, c) blood, d) lymph, e) interstitial fluid.

10. Exocrine glands work is regulated by: a) diencephalon, b) telencephalon, c) cerebellum, d) mesencephalon; e) medulla oblongata.

11. Visual analyzer consists of: a) eye bulb, b) eye bulb and auxiliary apparatus, c) photoreceptors, d) photoreceptors, optic nerve and optic cortex, e) optic cortex.

12. Auditory receptors receive sound vibration and transmit it through the hearing nerve to the: a) occipital lobe of the cortex, b) temporal lobe of the cortex, c) parietal lobe of the cortex, d) frontal lobe of the cortex, e) temporal and occipital lobes of the cortex.

13. A head of sperm contains: a) nucleus only, b) nucleus and Golgi complex, c) centrosome, d) mitochondria, e) centrosome and nucleus.

14. Pigment that colors the eye is in: a) cornea, b) iris, c) sclera, d) retina, e) pupil.

15. Diencephalon contains: a) 2 hemispheres, b) thalamus and hypothalamus, c) quadrigeminal bodies and cerebral peduncles, d) quadrigeminal bodies, e) 1 hemisphere and cerebral peduncles.

II. Complete these statements and write your answers in the table:

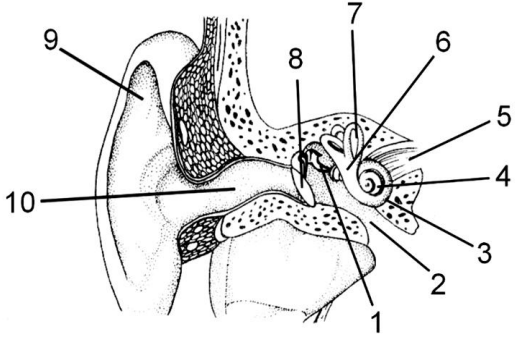
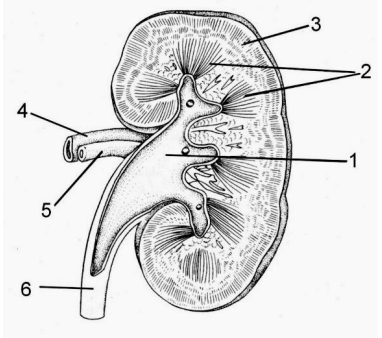
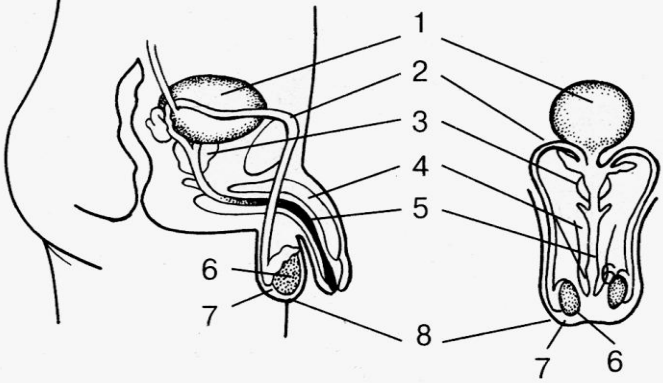
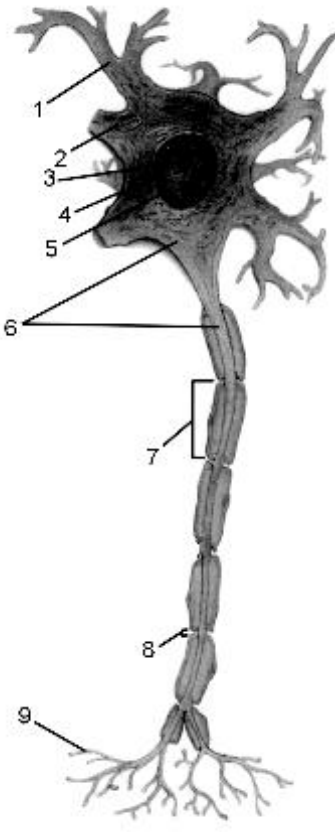
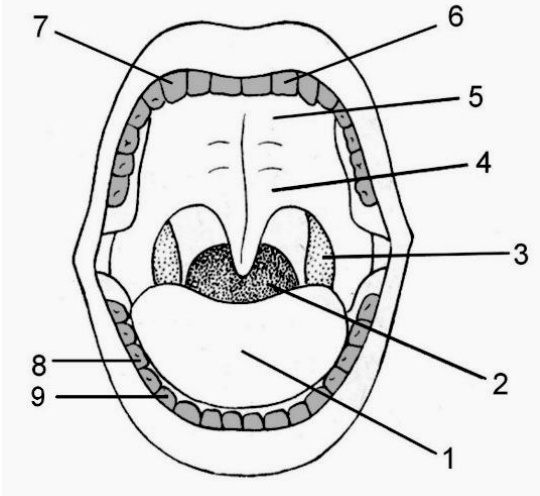
16. Skull bones are connected by...

17. A neurocranium includes frontal, occipital, temporal and ... bones

18. Lifespan of erythrocytes is ... days.

19. Sanguimotion (movement of blood) through the vessels is...

III. Write the answers for the questions to the table:

	
<p>20. What is indicated with «10» in the figure?</p>	<p>21. What is indicated with «2» in the figure?</p>
	
<p>22. What is indicated with «8» in the figure?</p>	
	<p>24. What is indicated with «8» in the figure?</p>
<p>23. What is indicated with «3» in the figure?</p>	

IV. Answer the question in writing form:

25. Structure of an eye.

TEST № 3

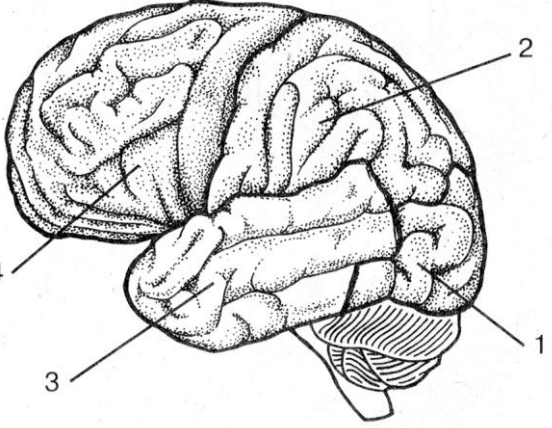
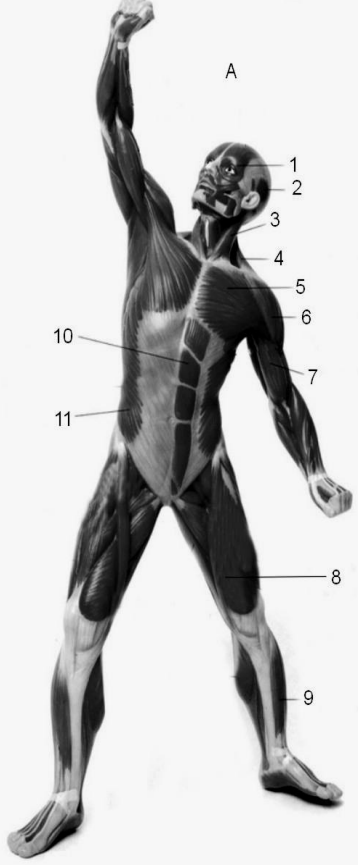
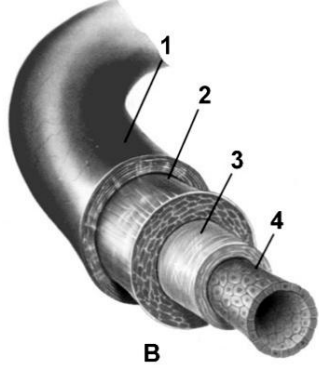
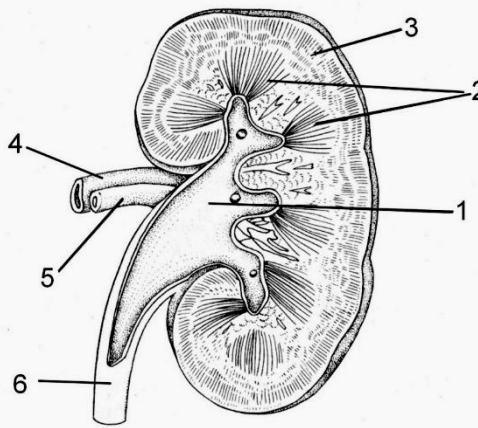
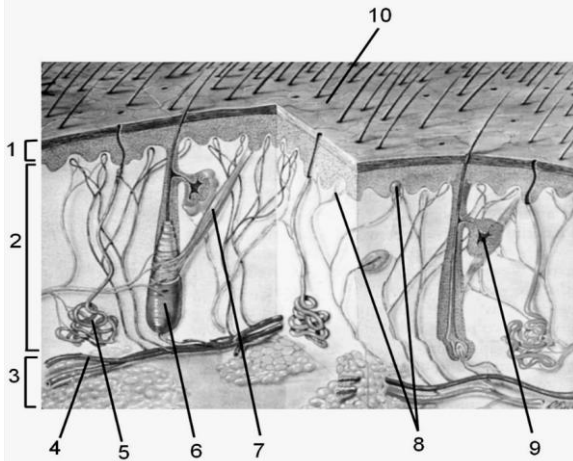
I. Select the letter of the correct answer and write it in the table:

1. **Epithelial tissue comprises:** a) skeletal muscles and internal organs, b) internal organs and skin, c) brain and skeletal muscles, d) spinal cord, skeletal muscles and skin, e) brain, spinal cord and internal organs.
2. **Bone body is covered with:** a) bone tissue, b) epithelial tissue, c) cartilage, d) muscular tissue, e) periosteum.
3. **A cervical spine contains vertebrae:** a) 5, b) 8, c) 10, d) 7, e) 6.
4. **Smooth muscular tissue has following properties:** a) consists of separate mononuclear cells 0,1 mm in length, b) contracts and tires quickly, c) contracts slowly and tires quickly, d) consists of separate mononuclear cells 0,1 sm in length, contracts and tires quickly, e) consists of separate mononuclear cells 10–12 sm in length.
5. **Function of erythrocytes:** a) transport, b) energetic, c) protective, d) structural, e) participate in blood coagulation.
6. **Duration of cardiac cycle is:** a) 0,5 sec, b) 0,7 sec, c) 0,8 sec, d) 0,9 sec, e) 0,4 sec.
7. **A systemic circulation:** a) begins from the left ventricle and ends in the left atrium, b) begins from the right ventricle and ends in the left atrium, c) begins from the left ventricle and ends in the right atrium, d) begins from the right ventricle and ends in the right atrium, e) begins from the left ventricle and ends in the right atrium.
8. **Alveolar walls are formed by:** a) one layer of epithelial cells and blood capillaries, b) two layers of epithelial cells and blood capillaries, c) one layer of epithelial cell, d) blood capillaries and muscular fibers, e) two layers of epithelial cells and muscular fibers.
9. **Micturition center is in:** a) medulla oblongata, b) spinal cord, c) diencephalon, d) mesencephalon (midbrain), e) telencephalon.
10. **Posterior roots are the processes of:** a) efferent (motor) neurons, b) afferent (sensory) neurons, c) efferent (sensory) neurons, d) afferent (motor) neurons, e) efferent and afferent neurons.
11. **Midbrain contains of:** a) 2 hemispheres, b) thalamus and hypothalamus, c) quadrigeminal bodies and cerebral peduncles, d) thalamus, e) 1 hemisphere.
12. **Under the sclera, there is:** a) cornea, b) iris, c) choroid, d) pupil, e) retina.
13. **Vibrations of the eardrum are transmitted to the:** a) stapes, b) incus, c) malleus, d) oval window, e) fluid in the cochlea.
14. **During the period of growth cells:** a) are divided by mitosis, b) increase in size, c) are divided by meiosis, d) produce gametes of a certain shape, e) are divided by amitosis.
15. **The inner ear contains:** a) drum (tympanic) membrane and ear bones, b) cochlea and organ of balance (equilibration), c) auditory tube (earing trumpet) and cochlea, d) auricle and ear bones, e) organ of balance (equilibration) and ear bones.

II. Complete these statements and write your answers in the table:

16. Auditory receptors are located on the basilar membrane of the ... ear.
17. A stomach is located in ... cavity
18. There is ... between lens and retina.
19. Main centers of sensitivity are located in...

III. Write the answers for the questions to the table:

	
<p>20.What is indicated with «3» in the figure?</p>	<p>22.What is indicated with «11» in the figure?</p>
	
<p>21.What is indicated with «4» in the figure?</p>	<p>24.What is indicated with «4» in the figure?</p>
	

IV. Answer the question in writing form:

25. Bone connection.

TEST № 4

I. Select the letter of the correct answer and write it in the table:

1. **Thoracic cavity contains:** a) lungs, heart, liver, b) trachea, esophagus, stomach, c) lungs, trachea, esophagus, d) esophagus, intestine, lungs, e) stomach, intestine, kidneys.

2. **Inorganic substances make bones:** a) soft, b) solid and strong, c) liquid, d) plastic, e) dynamic.

3. **A thoracic cage consists of:** a) ribs and sternum, b) ribs, sternum and cervical spine, c) ribs, sternum and thoracic spine, d) ribs, sternum and scapulae, e) ribs, sternum, scapulae and clavicles.

4. **Muscular fibers (myofibrils) contain proteins:** a) actin, hemoglobin, b) actin, myosin, c) myosin, fibrinogen, myoglobin, d) fibrinogen, prothrombin, e) actin, myosin, prothrombin.

5. **Interstitial fluid consists of:** a) lymph and plasma, b) blood, c) lymph, d) plasma, e) blood and lymph.

6. **Relaxation (diastole) of ventricles lasts:** a) 0,7 sec, b) 0,3 sec, c) 0,4 sec, d) 0,5 sec, e) 0,8 sec.

7. **Blood receives from tissues:** a) oxygen and nutrients, b) carbon dioxide and nutrients, c) oxygen and metabolites, d) carbon dioxide and metabolites, e) carbon dioxide only.

8. **The air in nasal cavity becomes:** a) warmed and humidified, b) purified from, c) purified from bacteria and warmed, d) warmed, e) warmed, humidified, purified from dust and bacteria.

9. **Primary urine is produced in:** a) capsule of nephron by filtration of blood plasma, b) tubule of nephron by filtration of blood plasma, c) tubule of nephron by reabsorption, d) capsule of nephron by reabsorption, e) pelvis by filtration of blood plasma.

10. **A white matter consists of:** a) bodies of neurons, b) axons, c) dendrites, d) axons and dendrites, e) bodies of neurons and dendrites.

11. **Weight of the brain is:** a) 1200 g, b) 1100–1200 g, c) 1200–1300 g, d) 1300–1500 g, e) 2200–2300 g.

12. **The external tunic in anterior part of the eye forms:** a) cornea, b) iris, c) pupil, d) vitreous body, e) lens.

13. **The external ear consists of:** a) external auditory canal (meatus) and drum (tympanic) membrane, b) external auditory canal (meatus), c) auricle and external auditory canal (meatus), d) malleus, stapes and incus, e) drum (tympanic) membrane and cochlea.

14. **A size of spermatozoon is:** a) 0,5–0,7 micrometers, b) 0,5–0,7 mm, c) are 1–2 micrometers, d) 2–2,5 mm, e) 1–2 mm.

15. **Medulla oblongata contains centers of regulation of:** a) respiration and circulation, b) balance, c) muscular tonus, d) metabolism, body temperature, e) exocrine glands work.

II. Complete these statements and write your answers in the table:

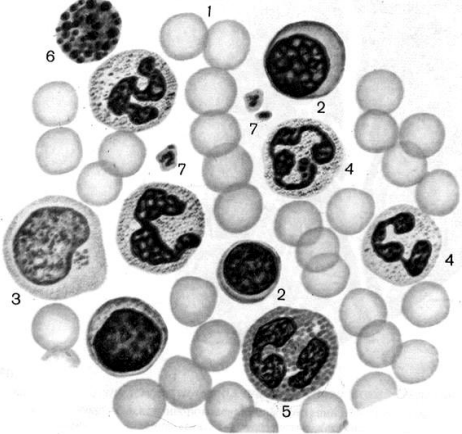
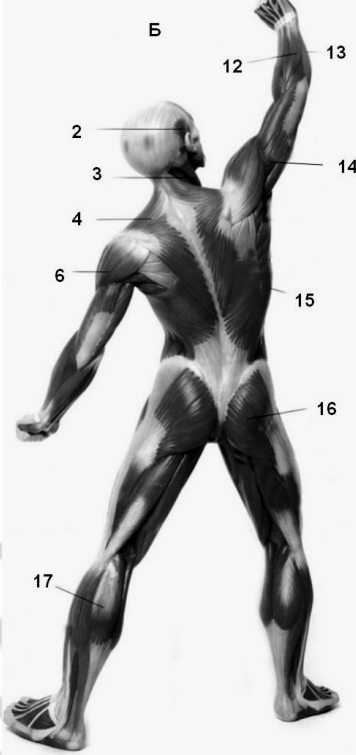
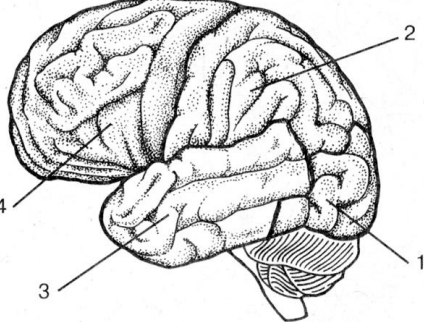
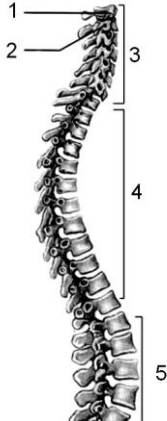
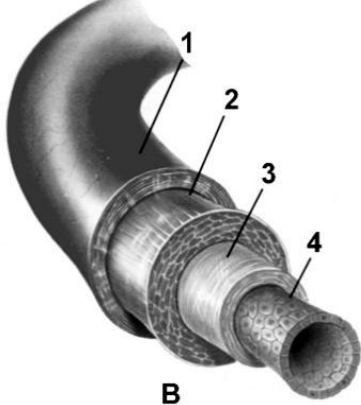
16. A short process of nervous cell is called...

17. Volume of the urinary is about...ml.

18. Proteins which accelerate biochemical reactions are called...

19. Bacteria of large intestine synthesize vitamins, ... and ...

III. Write the answers for the questions to the table:

	
<p>20. What is indicated with «3» in the figure?</p>	<p>22. What is indicated with «6» in the figure?</p>
	
<p>21. What is indicated with «1» in the figure?</p>	<p>24. What is indicated with «2» in the figure?</p>
	
<p>23. What is indicated with «1» in the figure?</p>	

IV. Answer the question in writing form:

25. Structure of a thorax.

TEST № 5

I. Select the letter of the correct answer and write it in the table:

1. **In human nervous tissue forms:** a) skeletal muscles and nerves, b) spinal cord and skin, c) brain, spinal cord and blood, d) brain, spinal cord and nerves, e) exocrine and endocrine glands.

2. **What is inside flat bones?** a) yellow marrow, b) water, c) epithelial tissue, d) red marrow, e) cerebrospinal liquids.

3. **A skeleton of the free upper limb consists of following parts:** a) shoulder, forearm, b) shoulder, forearm and hand, c) femur, crus (leg) and foot, d) shoulder, crus and hand, e) shoulder, forearm, foot.

4. **Determine the path in which excitation passes:** a) receptor-efferent neuron-interneuron-afferent neuron-working organ, b) working organ- afferent neuron- interneuron-efferent neuron- receptor, c) receptor- afferent neuron- efferent neuron- interneuron-working organ, d) receptor- afferent neuron- interneuron-efferent neuron- working organ, e) efferent neuron - interneuron- afferent neuron — working organ.

5. **Features of leukocytes:** a) unstable form, absence of a nucleus, participation in blood coagulation, b) formation of protective proteins – antibodies, presence of nucleus, c) contain the protein hemoglobin, presence of nucleus, d) take the form of a biconcave disk, have nuclei, e) form pseudopods, contain hemoglobin.

6. **Contraction (systole) of atria lasts:** a) 0,1 sec, b) 0,2 sec, c) 0,3 sec, d) 0,4 sec, e) 0,8 sec.

7. **In the pulmonary veins flows:** a) venous blood, to the right atrium, b) arterial blood, to the right atrium, c) venous blood, to the left atrium, d) arterial blood, to the left atrium, e) venous blood, to the lungs.

8. **Humoral regulation of breathing is associated with changes in the content of ... in the blood:** a) carbon dioxide, b) oxygen, c) carbon dioxide and oxygen, d) hormones, e) hormones and carbon dioxide.

9. **Kidneys are located in:** a) lumbar region of thoracic cavity aback, b) sacral region of abdominal cavity, on each side of the spine, c) lumbar region of abdominal cavity aback, on each side of the spine, d) sacral region of thoracic cavity, e) lumbar region of abdominal cavity in front.

10. **Anterior roots are the processes of:** a) efferent (motor) neurons, b) afferent (sensory) neurons, c) efferent (sensory) neurons, d) afferent (motor) neurons, e) efferent and afferent neurons.

11. **How many pairs of cerebral nerves originate from the brain?** a) 10, b) 11, c) 12, d) 13, e) 14.

12. **Visual area of the cerebral cortex is in the:** a) frontal lobe, b) parietal lobe, c) occipital lobe, d) temporal lobe, e) central sulcus (fissure).

13. **A sensory organ is a system that:** a) receive information, b) transfer information, c) receive and transfer information, d) analyze information, e) receive and analyze information.

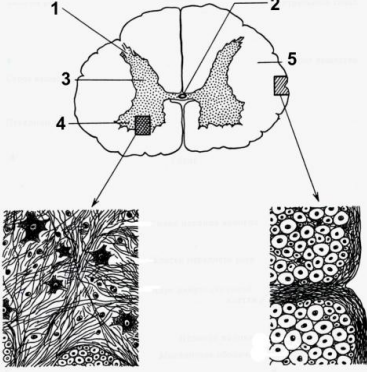
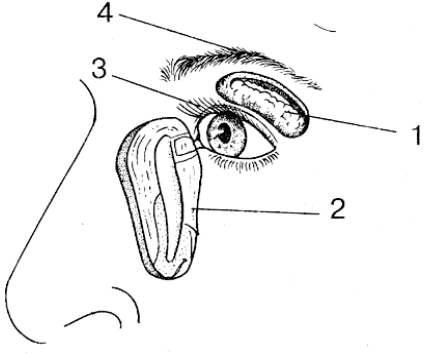
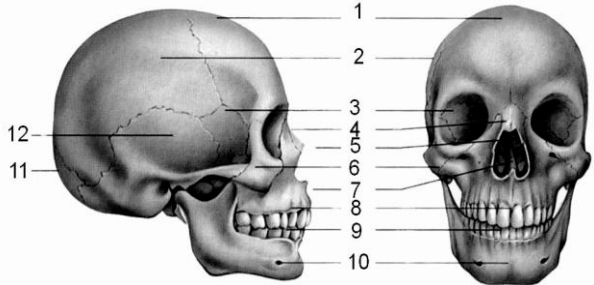
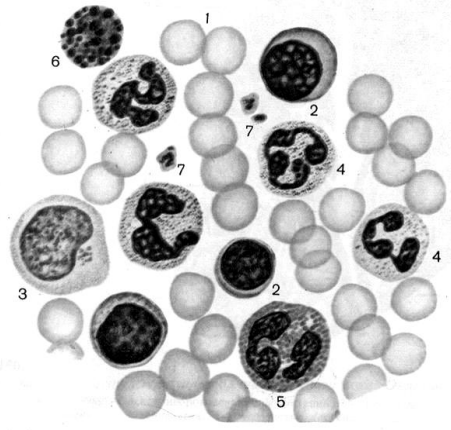
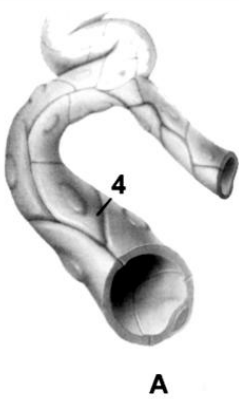
14. **Fluctuation of endolymph in cochlea is transmitted to the:** a) drum (tympanic) membrane, b) ear bones, c) tectorial membrane, d) membrane of oval window, e) membrane of round window.

15. **Female hormones are produced in:** a) fallopian tubes, b) ovaries, c) testis, d) uterus, e) vas deferens.

II. Complete these statements and write your answers in the table:

16. Ear bones (auditory ossicles) are situated at ... ear.
17. Blood is an example of ... tissue.
18. The spot with many visual receptors is called...
19. Cerebellum contains centers of regulation of balance, muscular tonus and ...

III. Write the answers for the questions to the table:

	
<p>20. What is indicated with «2» in the figure?</p>	<p>21. What is indicated with «2» in the figure?</p>
	
<p>22. 23What is indicated with «6» in the figure?</p>	
	 <p style="text-align: center;">A</p>
<p>23. What is indicated with «7» in the figure?</p>	<p>24. What is indicated with «4» in the figure?</p>

IV. Answer the question in writing form:

25. Components of a reflex arch.

TEST № 6

I. Select the letter of the correct answer and write it in the table:

1. **Tubular bone consists of:** a) body, heads, cartilage, b) body and heads, c) body, cartilage and periosteum, d) cartilage and periosteum, e) body, heads, cartilage and periosteum.

2. **A neurocranium contains bones:** a) frontal, temporal, zygomatic, b) temporal, maxillary, parietal, c) occipital, temporal, parietal, d) zygomatic, temporal, frontal, e) temporal, frontal, zygomatic.

3. **Striated muscular tissue has following properties:** a) multinucleated cells, consists of fibers 10–12 sm in length, b) mononuclear cells, has light and dark discs, c) consists of fibers 10–12 sm in length, contracts and tires quickly, d) has light and dark discs, contracts quickly and runs continuously, e) contracts and tires slowly.

4. **Erythrocytes contain the protein:** a) actin, b) myosin, c) hemoglobin, d) fibrinogen, e) prothrombin.

5. **Contraction (systole) of ventricles lasts:** a) 0,1 sec, b) 0,2 sec, c) 0,3 sec, d) 0,4 sec, e) 0,8 sec.

6. **Arteries are the vessels which:** a) spring from the heart and carry mixed blood, b) come to the heart and carry arterial blood, c) come to the heart and carry venous blood, d) spring from the heart and carry arterial blood, e) spring from the heart.

7. **The tracheal wall consists of:** a) cartilaginous semirings, b) cartilaginous rings, c) muscular tissue, d) epithelial tissue, e) muscular and epithelial tissue

8. **Hair bags are located in:** a) papillary dermis, b) reticular layer of the dermis, c) papillary and reticular dermis, d) epidermis, e) subcutaneous fat.

9. **The central nervous system includes:** a) red marrow, b) yellow marrow, c) spinal cord and brain, d) ganglia, e) nerves and nerve endings (receptors).

10. **A gray substance covers following part of the brain:** a) telencephalon and mesencephalon, b) mesencephalon and cerebellum, c) telencephalon and cerebellum, d) diencephalon, e) medulla oblongata and telencephalon.

11. **Hearing area of the cerebral cortex is in:** a) frontal lobe, b) parietal lobe, c) occipital lobe, d) temporal lobe, e) central sulcus (fissure).

12. **An analyzer is a system that:** a) receive information, b) transfer information, c) analyze information, d) receive and transfer information, e) receive, transfer and analyze information.

13. **Determine the correct order of ear bones conjunction:** a) malleus- incus- stapes-oval window, b) malleus- stapes-incus- oval window, c) malleus- stapes-incus- round window, d) stapes-incus- malleus-round window, e) incus- malleus- stapes-oval window.

14. **Female gonads are called:** a) ovaries, b) fallopian tubes, c) testis, d) vas deferens, e) uterus.

15. **The thickness of the cerebral cortex is:** a) 2–4 sm, b) 2–4 mm, c) 5–10 sm, d) 5–10 mm, e) 10–15 mm.

II. Complete these statements and write your answers in the table:

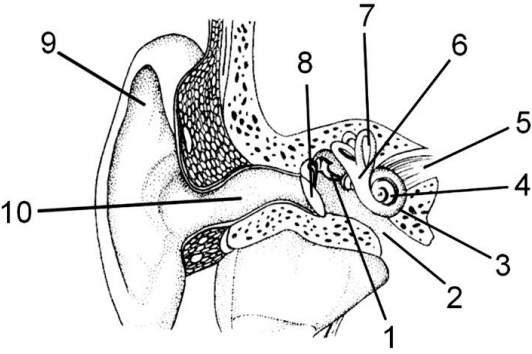
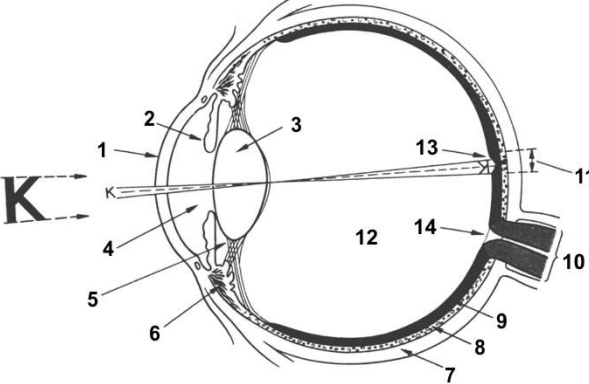
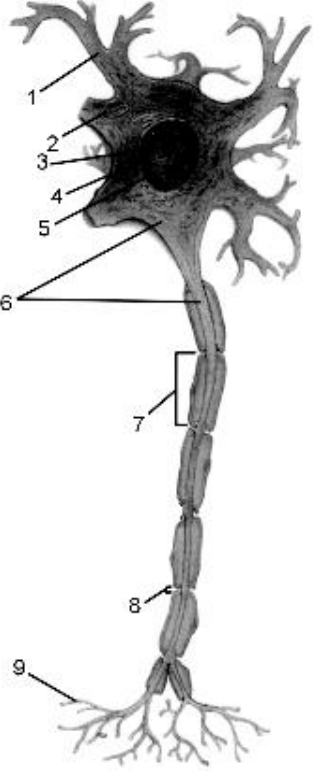
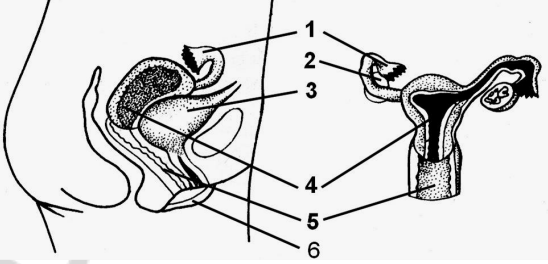
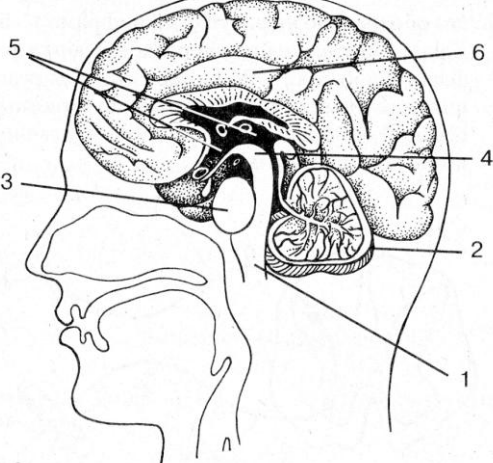
16. Movable conjunction of bones is called...

17. A thoracic cage contains ... pairs of ribs.

18. Blood cells are produced in ... bone marrow.

19. The male reproductive system consists of testes, ..., ejaculatory duct and penis.

III. Write the answers for the questions to the table:

	
<p>20. What is indicated with «1» in the figure?</p>	<p>21. What is indicated with «4» in the figure?</p>
	
<p>23. What is indicated with «9» in the figure?</p>	
<p>23. What is indicated with «9» in the figure?</p>	<p>24. What is indicated with «4» in the figure?</p>

IV. Answer the question in writing form:

25. The structure of skin.

TEST № 7

I. Select the letter of the correct answer and write it in the table:

1. **Area of the cerebral cortex is:** a) 1500–2000 sm², b) 2000–2500 sm², c) 3000–3500 sm², d) 3500–4000 sm², e) 4000–4500 sm².

2. **Vegetative nervous system is responsible for the work of:** a) skeletal muscles, b) heart only, c) liver only, d) digestive and respiratory systems only, e) all internal organs.

3. **Name layers of the human skin:** a) connective, muscular, epithelial, b) epidermis, derma, c) derma, subcutaneous fat, d) epidermis, derma, subcutaneous fat, e) cortical layer, medulla oblongata.

4. **Determine the way in which air passes into the airways:** a) nasal cavity, larynx, nasopharynx, trachea, bronchi, bronchioles, b) nasopharynx, nasal cavity, larynx, trachea, bronchioles, bronchi, c) nasal cavity, nasopharynx, larynx, trachea, bronchi, bronchioles, d) larynx, nasopharynx, trachea, nasal cavity, bronchi, bronchioles, e) nasal cavity, nasopharynx, trachea, larynx, bronchi, bronchioles.

5. **In the pulmonary arteries flows:** a) venous blood, to the left atrium, b) venous blood, to the right atrium, c) arterial blood, to the left atrium, d) arterial blood, to the lungs, e) venous blood, to the lungs.

6. **The heart wall consists of:** a) epicardium, b) pericardium, c) epicardium and myocardium, d) pericardium, myocardium, endocardium, e) endocardium, myocardium and epicardium.

7. **Lifespan of white blood cells:** a) 120 days, b) 2–4 days, c) 8–11 days, d) 210 days, e) 15–30 days.

8. **Muscles of the head are:** a) biceps, masseter, b) triceps, mimic, c) masseter and mimic, d) intercostal, e) biceps and triceps

9. **A coccygeal spine contains vertebrae:** a) 4, b) 5, c) 4–5, d) 3, e) 5–6.

10. **A joint consists of:** a) articular head, articular cavity, articular capsule, b) articular capsule and synovial fluid, c) articular head, articular cavity, articular capsule, synovial fluid, d) articular head, articular cavity, e) articular head, articular cavity, synovial fluid.

11. **Abdominal cavity contains:** a) lungs, liver, b) trachea, esophagus, stomach, c) stomach, intestine, liver, d) heart, liver, intestine, e) kidneys, heart, liver.

12. **A cervix of sperm contains:** a) centrosome and mitochondria, b) nucleus, c) Golgi complex and mitochondria, d) Golgi complex, e) mitochondria.

13. **The auditory tube (earing trumpet) connects nasopharynx with:** a) external ear, b) middle ear, c) inner ear, d) pharynx, e) environment.

14. **A central part of analyzer is represented by:** a) cortex, b) cerebellum, c) diencephalon, d) mesencephalon, e) spinal cord.

15. **Somatic nervous system is responsible for the work of:** a) heart, b) stomach, c) liver, d) skeletal muscles, e) lungs.

II. Complete these statements and write your answers in the table:

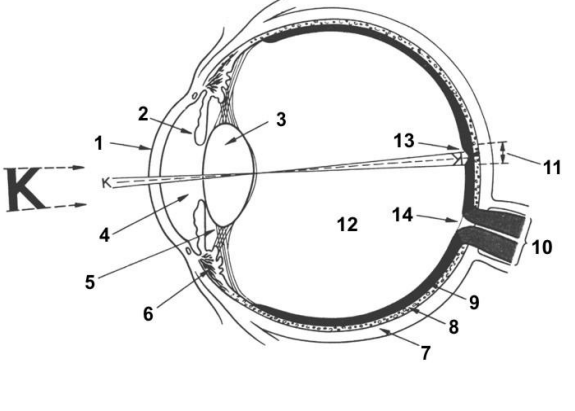
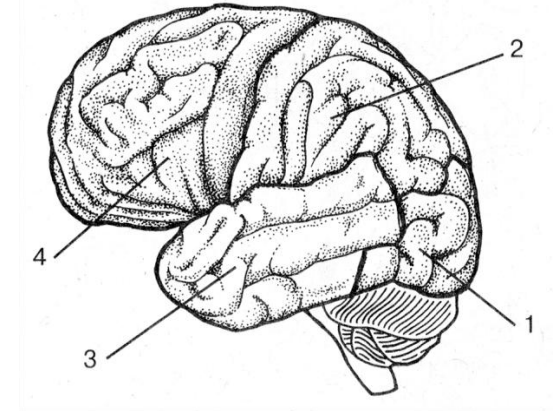
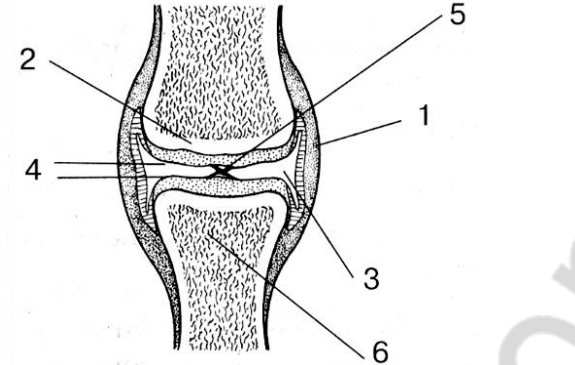
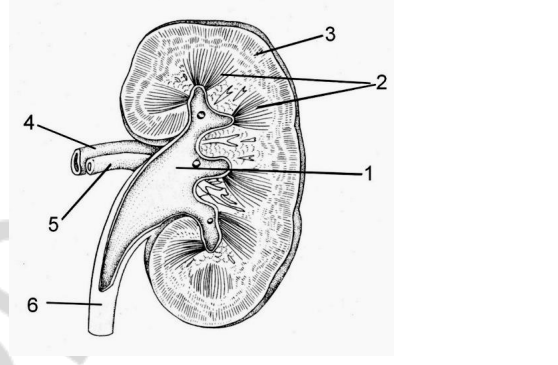
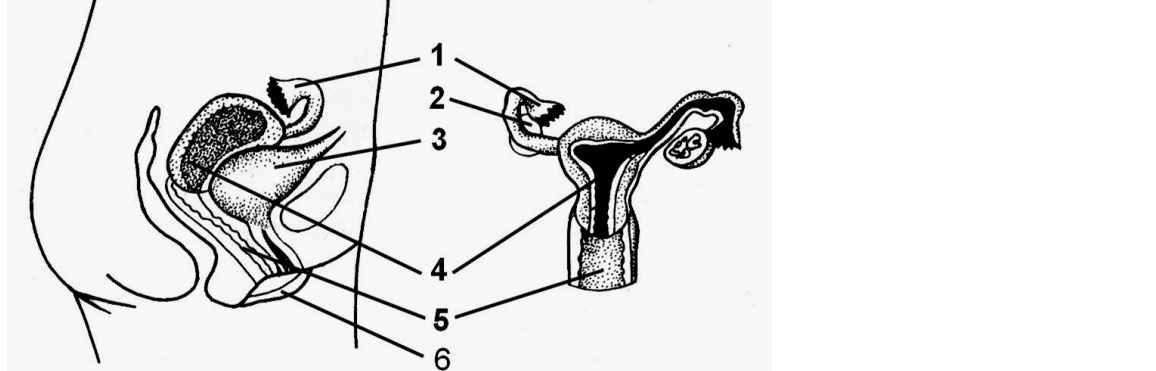
16. Kidneys produce ... liters of secondary urine per day.

17. Derma has 2 layers: papillary and ...

18. Posterior roots are the processes of ... neurons.

19. Main centers of sensitivity are located in ...

III. Write the answers for the questions to the table:

	
<p>20. What is indicated with «7» in the figure?</p>	<p>21. What is indicated with «4» in the figure?</p>
	
<p>22. What is indicated with «3» in the figure?</p>	<p>23. What is indicated with «6» in the figure?</p>
	
<p>24. What is indicated with «5» in the figure?</p>	

IV. Answer the question in writing form:

25. Red blood cells.

TEST № 8

I. Select the letter of the correct answer and write it in the table:

1. **Bone and cartilage are examples of tissues:** a) dense connective tissue, b) liquid connective tissue, c) loose fibrous tissue, d) soft connective tissue, e) epithelial.

2. **What is inside bodies of tubular bones?** a) yellow marrow, b) lymph, c) epithelial tissue, d) red marrow, e) cerebrospinal liquids.

3. **Human spine consists of following regions:** a) trunkal and caudal, b) cervical, trunkal and sacral, c) cervical, thoracic, sacral and coccygeal, d) cervical, thoracic, lumbar, sacral and coccygeal, e) cervical, trunkal, lumbar and coccygeal.

4. **A length of smooth muscular cell is:** a) 1 mm, b) 10–12 sm, c) 0,1 mm, d) 0,2 mm, e) 0,3 mm.

5. **Lymph composition is similar to:** a) interstitial fluid, b) blood, c) plasma and interstitial fluid, d) plasma, e) blood and interstitial fluid.

6. **Features of platelets:** a) unstable form, absence of a nucleus, b) unstable form, presence of nucleus, c) take the form of a biconcave disk, presence of nucleus, d) take the form of a biconcave disk, have nucleus, live 8–11 days, e) absence of a nucleus, live 8-11 days, participate in blood coagulation.

7. **Endocardium consists of tissue:** a) connective, b) muscular, c) connective tissue covered by epithelium, d) epithelial, e) muscular tissue covered by epithelium.

8. **Left heart contains:** a) venous blood only, b) arterial blood only, c) venous and arterial blood, d) mixed blood, e) mixed, venous and arterial blood.

9. **Melanin is in the:** a) derma, b) epidermis, c) subcutaneous fat, d) epidermis, derma, e) derma and subcutaneous fat.

10. **How many pairs of spinal nerves originate from the spinal cord:** a) 30, b) 31, c) 32, d) 33, e) 34.

11. **Subcortical centers of vision and hearing are located in:** a) mesencephalon, b) medulla oblongata, c) diencephalon, d) cerebellum, e) telencephalon.

12. **Cerebellum is located:** a) above the mesencephalon, b) above the medulla oblongata, c) between telencephalon and diencephalon, d) between diencephalon and mesencephalon, e) under the medulla oblongata.

13. **A peripheral part of analyzer consists of:** a) tracts in which impulses go from sensory organs to the brain, b) cortex, where an analysis of information takes place, c) receptors of sensory organs, d) posterior horns of spinal cord, e) anterior horns of spinal cord.

14. **A nucleus of spermatozoon has set of chromosomes:** a) haploid, b) diploid, c) triploid, d) tetraploid, e) polyploid.

15. **During the period of maturation cells:** a) are divided by mitosis, b) increase in size, c) are divided by meiosis, d) produce gametes of a certain shape, e) are divided by amitosis.

II. Complete these statements and write your answers in the table:

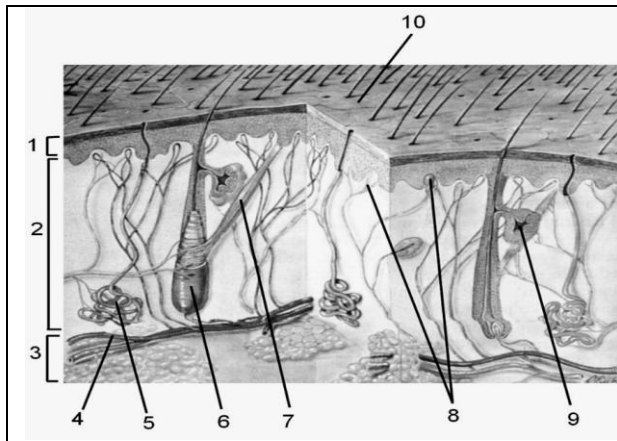
16. Nerve impulses from the auditory receptors are transmitted through the auditory nerve to the ... lobe of the cerebral cortex.

17. Between external and middle ear there is ... membrane.

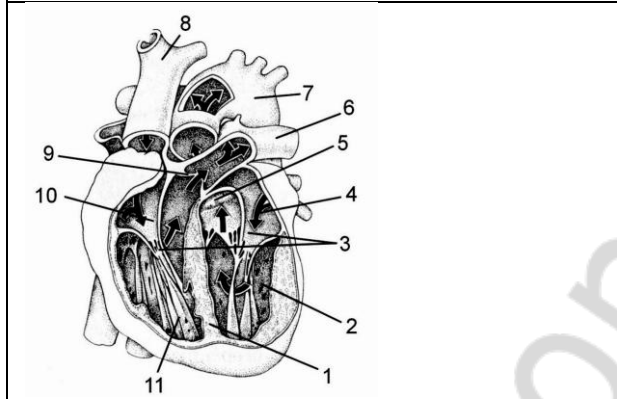
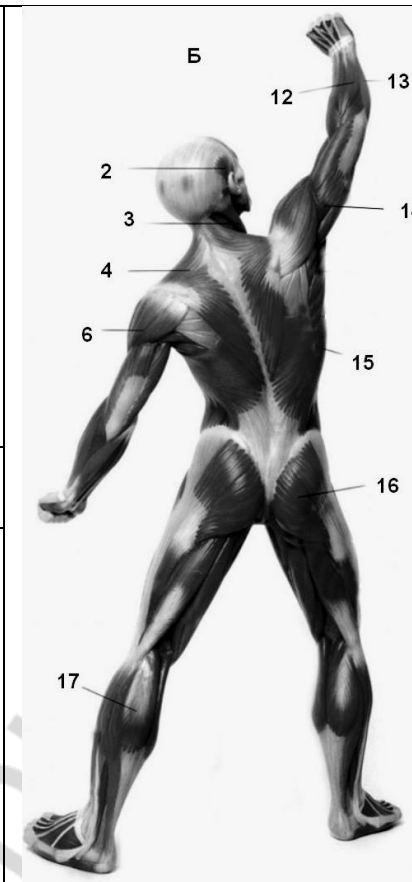
18. Analysis of visual stimuli occurs un ... lobe of the cortex.

19. Subcortical centers of vision and hearing are located in...

III. Write the answers for the questions to the table:

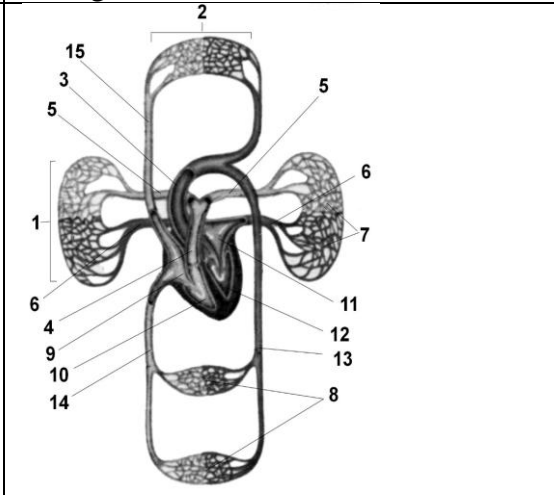
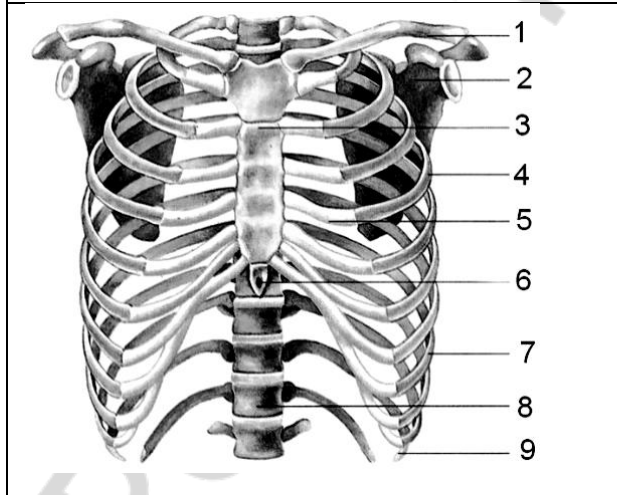


20. What is indicated with «3» in the figure?



21. What is indicated with «8» in the figure?

22. What is indicated with «17» in the figure?



23. What is indicated with «2» in the figure?

24. What is indicated with «1» in the figure?

IV. Answer the question in writing form:

25. Cardiac cycle.

TEST № 9

I. Select the letter of the correct answer and write it in the table:

1. An organ is a part of the body that has: a) impermanent structure, b) impermanent structure and certain function, c) permanent structure and certain function, d) permanent structure and different functions, e) impermanent structure and different functions

2. Periosteum consists of: a) epithelial tissue, b) nervous, c) muscular tissue, d) connective, e) epithelial and nervous.

3. How many pairs of ribs the human has? a) 9, b) 10, c) 11, d) 12, e) 20.

4. Muscles are formed by: a) bone tissue, b) muscular and epithelial tissues, c) nervous and muscular, d) muscular, e) connective and muscular.

5. Features of erythrocytes: a) take the form of a biconcave disk, have nucleus, b) unstable form, absence of nucleus, live 2-4 days, c) take the form of a biconcave disk, absence of nucleus, d) take the round form, absence of nucleus, live 120 days, e) unstable form, absence of nucleus, formation of protective proteins – antibodies, f) live 2–4 days, have nucleus.

6. Epicardium consists of tissue: a) connective, b) muscular, c) connective tissue covered by epithelium, d) epithelial, e) muscular tissue covered by epithelium.

7. The vena cava carries: a) venous blood, to the right atrium, b) arterial blood, to the right atrium, c) venous blood, to the left atrium, d) arterial blood, to the left atrium, e) venous blood, to the right ventricle.

8. Nervous control of respiration is provided by respiratory center located in: a) telencephalon, b) midbrain, c) cerebral hemispheres, d) medulla oblongata, e) cerebellum (little brain).

9. Sweat glands are located in: a) papillary dermis, b) reticular layer of the dermis, c) papillary and reticular dermis, d) epidermis, e) subcutaneous fat.

10. The peripheral nervous system includes: a) nerves and ganglia, b) red marrow, c) yellow marrow, d) spinal cord, e) brain.

11. A white substance covers following part of the brain: a) telencephalon, mesencephalon and diencephalon, b) mesencephalon, diencephalon and medulla oblongata, c) cerebellum, d) telencephalon, cerebellum, e) diencephalon, cerebellum and telencephalon.

12. The external tunic of the eye is: a) fibrotic tunic, b) iris, c) sclera, d) choroid, e) retina.

13. The inner ear is located in: a) occipital bone, b) parietal bone, c) frontal bone, d) temporal bone, e) sphenoid bone.

14. During the proliferative (reproductive) period cells: a) are divided by mitosis, b) increase in size, c) are divided by meiosis, d) produce gametes of a certain shape, e) are divided by amitosis.

15. Area of skin-muscular sense is in the: a) frontal lobe, b) parietal lobe, c) occipital lobe, d) temporal lobe, e) central sulcus (fissure).

II. Complete these statements and write your answers in the table:

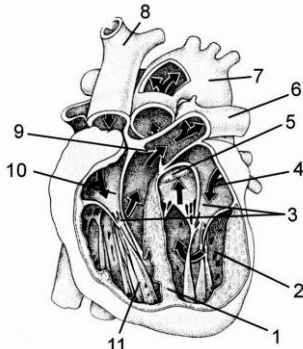
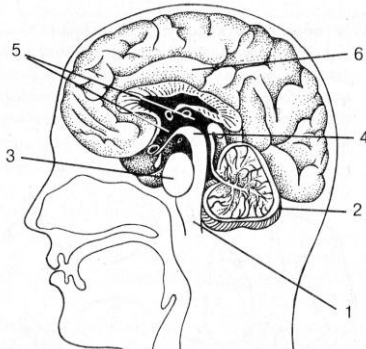
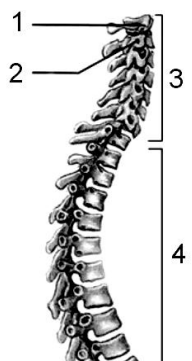
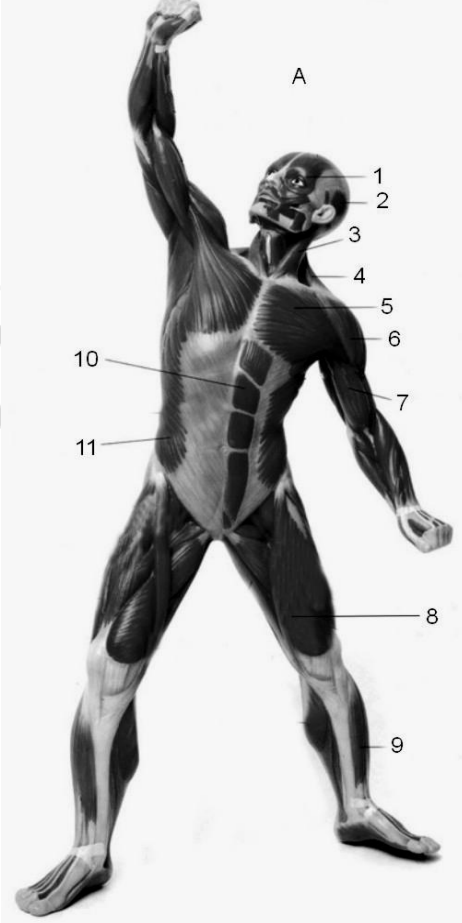
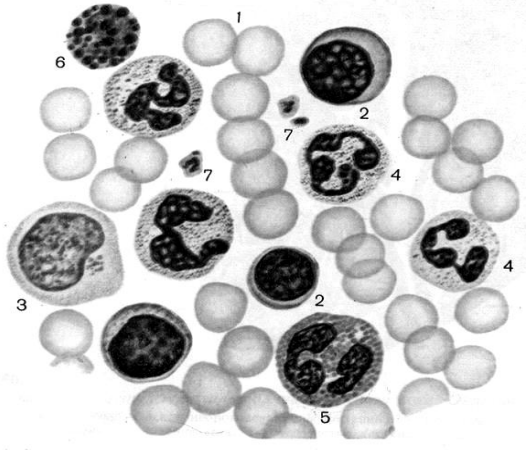
16. Urinary system consist of kidneys, ..., bladder and urethra

17. Pancreatic juice enzymes act in ... environment (medium).

18. In humans oral cavity has ... pairs of salivary glands.

19. ... are found at the ends of the bronchioles.

III. Write the answers for the questions to the table:

	
<p>20. What is indicated with «1» in the figure?</p>	<p>21. What is indicated with «5» in the figure?</p>
	
<p>22. What is indicated with «1» in the figure?</p>	<p>24. What is indicated with «10» in the figure?</p>
	
<p>23. What is indicated with «5» in the figure?</p>	

IV. Answer the question in writing form:

25. Systemic circulation.

TEST № 10

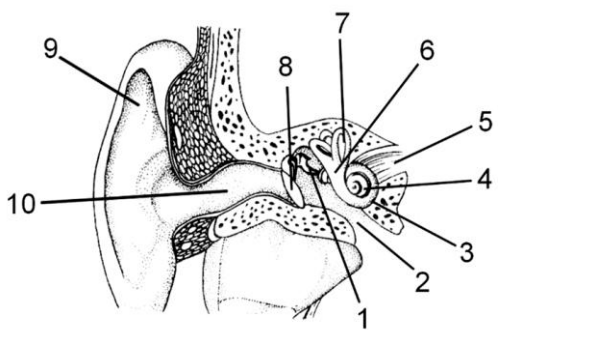
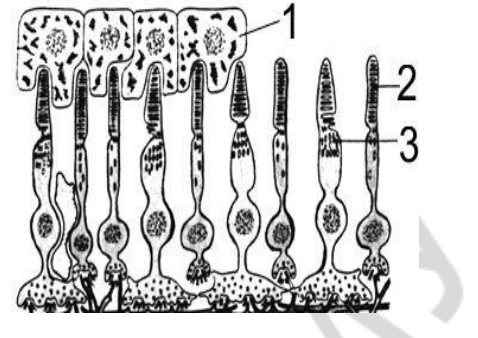
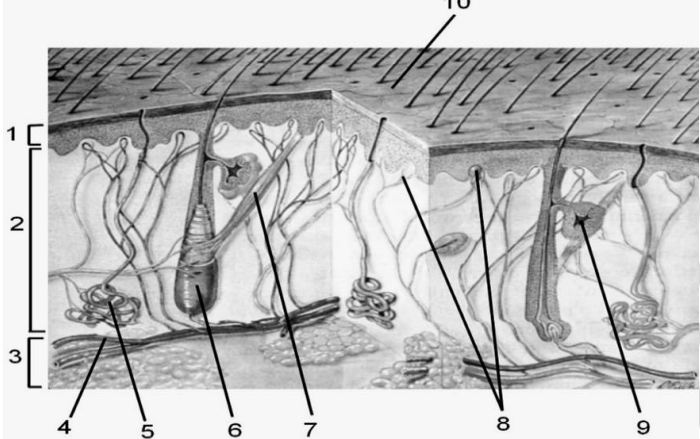
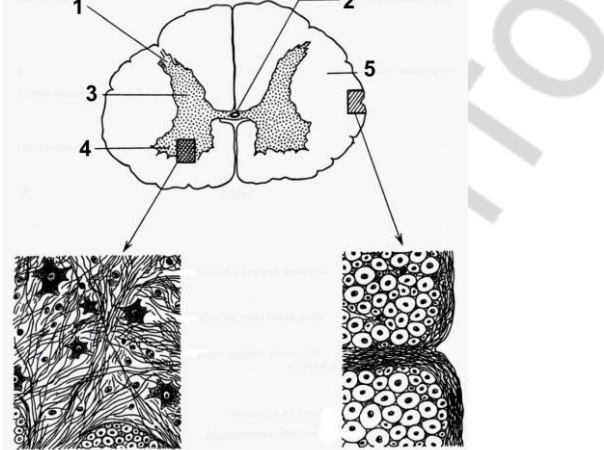
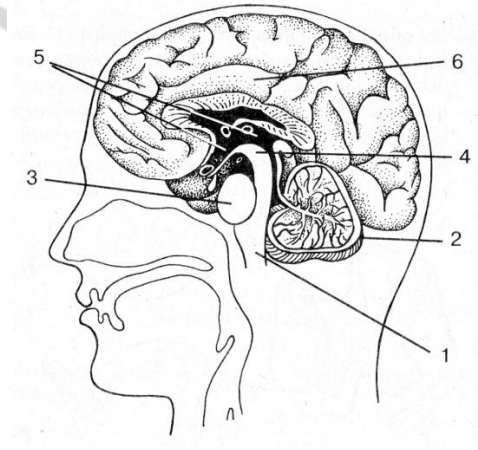
I. Select the letter of the correct answer and write it in the table:

1. **Blood is a tissue:** a) dense connective tissue, b) liquid connective tissue, c) loose fibrous tissue, d) epithelial, e) muscular.
2. **Heads of bones are covered with:** a) bone tissue, b) epithelial tissue, c) cartilage, d) muscular tissue, e) periosteum.
3. **A human spine contains vertebrae:** a) 12–20, b) 13–14, c) 25–28, d) 33–34, e) 60–63.
4. **Lifespan of red blood cells:** a) 2–4 days, b) 120 days, c) 8–11 days, d) 10–15 days, e) 1–2 days.
5. **Leukocytes are formed in:** a) red marrow, b) lymph nodes, c) spleen, d) red marrow, spleen and lymph nodes, e) spleen and yellow marrow.
6. **The heart wall consists of layers:** a) 3, b) 2, c) 5, d) 1, e) 4.
7. **Through the capillary wall tissues receive:** a) oxygen and nutrients, b) carbon dioxide and nutrients, c) oxygen and metabolites, d) carbon dioxide and metabolites, e) oxygen only.
8. **Prime importance in the excretion of metabolic products has the system:** a) respiratory, b) endocrine, c) urinary, d) digestive, e) circulatory.
9. **A gray matter consists of:** a) bodies of neurons, b) axons, c) dendrites, d) axons and dendrites, e) bodies of neurons and dendrites.
10. **Diencephalon contains centers of regulation of:** a) respiration, b) balance, c) metabolism, body temperature, d) muscular tonus, e) circulation.
11. **Cerebral cortex contains:** a) 10 million neurons, b) 10 billion neurons, c) 12 million neurons, d) 12 billion neurons, e) 14 billion neurons.
12. **A vitreous body is located:** a) behind the retina, b) between lens and retina, c) between cornea and iris, d) in lens, e) in cornea.
13. **Vibrations of the membrane of the oval window are transmitted to the:** a) drum (tympanic) membrane, b) malleus, c) incus, d) stapes, e) fluid in the cochlea.
14. **Testes produce:** a) male hormones only, b) male gametes (sperm) only, c) male and female hormones, d) female gametes (eggs), e) male hormones and gametes.
15. **Male gonads are called:** a) testis, b) fallopian tubes, c) ovaries, d) vas deferens (deferent duct), e) ejaculator duct.

II. Complete these statements and write your answers in the table:

16. An embryo develops in...
17. The length of external auditory canal (meatus) is ... mm.
18. The spot with many visual receptors is called ...
19. Secondary urine is formed in ... of the nephron.

III. Write the answers for the questions to the table:

	
<p>20. What is indicated with «5» in the figure?</p>	<p>21. What is indicated with «3» in the figure?</p>
	
<p>22. What is indicated with «6» in the figure?</p>	
	
<p>23. What is indicated with «1» in the figure?</p>	<p>24. What is indicated with «6» in the figure?</p>

IV. Answer the question in writing form:

25. Urine formation.

**TOPIC 4. CONTROL CLASS ON SUBJECT
«ZOOLOGY»**

TEST № 1

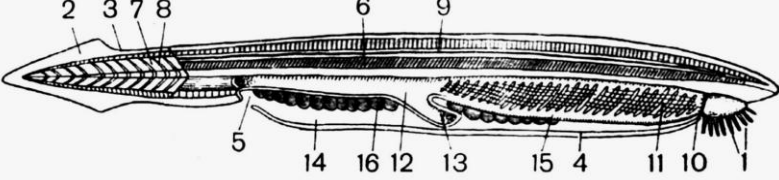
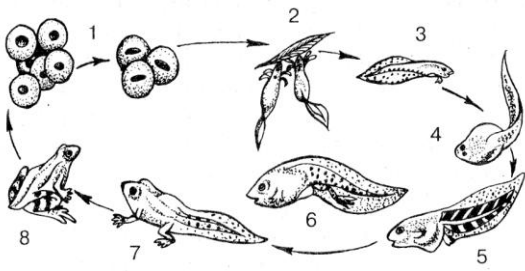
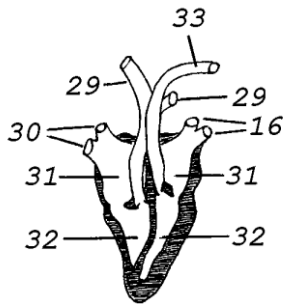
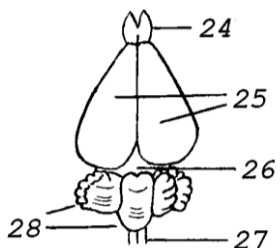
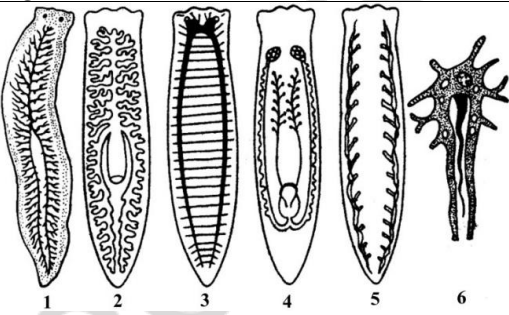
I. Select the letter of the correct answer and write it in the table:

- 1. Bacteria in the form of rods are called:** a) cocci, b) bacilli, c) vibrio, d) spirilla, e) vireos.
- 2. Malaria parasite is a representative of the phylum:** a) Sarcomastigophora, b) Ciliophora, c) Apicomplexa, d) Arthropoda, e) Chordata.
- 3. Features of the digestive system of flatworms:** a) foregut, midgut and excretory pore, b) foregut, midgut, hindgut, excretory pore is absence, c) foregut, midgut, hindgut and rectum, d) foregut, midgut, excretory pore is absent, e) midgut and hindgut, excretory pore is absent.
- 4. The principal host of a liver fluke is (are):** a) only human, b) human and cattle, c) only cattle, d) cats, e) snails.
- 5. The correct sequence of stages in the life cycle of the beef tapeworm:** a) egg – mease – oncosphere – adult tapeworm, b) oncosphere – mease – adult tapeworm, c) egg – oncosphere – mease – adult tapeworm, d) mease – egg – oncosphere – adult tapeworm, e) egg – miracidia – mease – adult tapeworm.
- 6. The digestive system of roundworms contains:** a) oral sucker, b) stomach, c) mouth and anus, d) mouth and stomach, e) liver.
- 7. Functions of arthropod's chitin are:** a) respiration, b) sensory, c) digestion, d) protection and exoskeleton functions, e) protection only.
- 8. Features of ticks are:** a) body consist of 3 regions, b) body is not subdivided into regions, development is direct, c) body consists of 2 regions, d) body is not subdivided into regions, development goes with metamorphosis, e) development is direct.
- 9. Insect mouthparts consist of:** a) upper and lower lips only, b) upper and lower jaws only, c) upper and lower lips and upper and lower jaws, d) upper jaw and lip, e) lower jaw and lip.
- 10. Sensory organs of the lancelet are:** a) olfactory fossa, b) simple eyes, c) hearing organ, d) taste receptors in the mouth, e) compound eyes.
- 11. Fish excretory organs are:** a) protonephridia, b) metanephridia, c) nephridia, d) mesonephric kidneys, e) pelvic kidneys.
- 12. The spine of amphibians can be subdivided into:** a) cervical, thoracic, caudal regions, b) cervical, lumbar, sacral, caudal regions, c) lumbar, sacral, caudal regions, d) cervical, thoracic, sacral, caudal regions, e) cervical, trunkal, lumbar, caudal regions.
- 13. Organisms which don't belong to the class Reptilia are:** a) lizards, b) snakes, c) crocodiles, d) turtles, e) newts.
- 14. Only mammal's skin has:** a) glands, b) hairs, c) epidermis, d) dermis, e) no corneous scales.
- 15. Features that are not typical for mammal's development:** a) intrauterine development, b) descendants are fed on milk, c) fertilization is internal, d) development is direct, e) fertilization is external, development occurs with metamorphosis.

II. Complete these statements and write your answers in the table:

16. Bacteria multiply by ...
17. A heart of the fish is ...-chambered.
18. The dermo-muscular body wall of flatworms consists of 3 layers of smooth muscles: circular, diagonal and...
19. Liver ducts of spiders are open into ... gut.

III. Write the answers for the questions to the table:

	
<p>20. What is indicated with «6» in the figure?</p>	
	
<p>21. What is indicated with «4» in the figure?</p>	
	
<p>22. What is indicated with «33» in the figure?</p>	<p>23. What is indicated with «25» in the figure?</p>
	
<p>24. What is indicated with «3» in the figure?</p>	

IV. Answer the question in writing form:

25. Pathogenic bacteria and methods to combat them.

TEST № 2

I. Select the letter of the correct answer and write it in the table:

1. **Bacteria in the form of spirals are called:** a) cocci, b) bacilli, c) vibrio, d) spirilla, e) vireos.
2. **Protists that have changeable body shape:** a) euglenoids, amoebas, b) ciliates, c) amoebas, Giardia, d) euglenoids, ciliates, e) amoebas.
3. **There are following classes of the phylum flatworms:** a) arachnids and flukes, b) turbellarians and tapeworms, c) crustaceans and turbellarians, d) turbellarians, flukes and tapeworms, e) amphibians and tapeworms.
4. **Features of reproduction and development of parasitic flatworms:** a) complex life cycles with the change of hosts, direct development, b) life cycles without changing hosts, direct development, c) life cycles without changing hosts, development with a metamorphosis, d) complex life cycles, development with a metamorphosis, e) asexual reproduction, direct development.
5. **Mature segments of tapeworms are located:** a) in front of the body, b) in the middle of the body, c) in the rear part of the body, d) in the front and middle of the body, e) in the middle and at the end of the body.
6. **The circulatory system of roundworms:** a) has a tubular heart on the dorsal side, b) has a tubular heart on the ventral side, c) is absent, d) has sacciform heart, e) has a two-chambered heart.
7. **The body cavity of arthropods is:** a) absent, b) primary, c) secondary, d) tertiary, e) mixed.
8. **The number of pairs of appendages near the arachnid's mouth is:** a) two, b) three, c) four, d) five, e) six.
9. **Regions of the digestive system of the insect are:** a) mouth, pharynx, stomach, b) mouth, esophagus, gut, c) mouth, pharynx, esophagus, gut, d) mouth, pharynx, esophagus, stomach, gut, e) mouth, stomach, gut.
10. **Lancelet's circulatory system is:** a) absent, b) open, c) closed, d) compose from the heart and blood vessels, e) abdominal aorta does not perform the function of the heart.
11. **The spine of the fish is subdivided into:** a) cervical and thoracic regions, b) head, trunkal and caudal regions, c) trunkal and caudal regions, d) trunkal, lumbar and caudal regions, e) cervical, trunkal and caudal regions.
12. **Pectoral girdle of amphibians consists of:** a) scapula and clavicle, b) bones of the forearm and the upper arm, c) breastbone, coracoids, scapula and clavicle, d) scapula, clavicle and humerus, e) coracoids, scapula and clavicle.
13. **Respiratory tract of reptiles is:** a) trachea and choanes, b) trachea, bronchi and bronchioles, c) alveolar passages, d) trachea and two bronchi, e) bronchial tree.
14. **Features of the excretory system of mammals:** a) ureters are open into the urinary bladder, b) ureters are open into the cloaca, c) pelvic kidneys, urine is excreted through the uretra, d) mesonephric kidneys, e) pelvic kidneys, ureters are open into the cloaca.
15. **Reptile skin is:** a) dry, does not have glands, covered with corneous scales, b) wet, contains glands, c) dry, contains glands, d) wet, don't contains glands, e) wet, contains glands, covered with corneous scales.

II. Complete these statements and write your answers in the table:

- 16. Ureter and urinary bladder of the reptile are open into...
- 17. A larva of the amphibian is called...
- 18. The skeleton of the fish is subdivided into head, caudal and ... regions.
- 19. Causative agents of plague are transmitted by...

III. Write the answers for the questions to the table:

<p>20. What is indicated with «6» in the figure?</p>	
<p>21. What is indicated with «8» in the figure?</p>	<p>22. What is indicated with «1» in the figure?</p>
<p>23. What is indicated with «3» in the figure?</p>	<p>24. What is indicated with «4» in the figure?</p>

IV. Answer the question in writing form:

- 25. Prevention of cestodosis.

TEST № 3

I. Select the letter of the correct answer and write it in the table:

1. **Nucleoid is:** a) capsule, b) genetic apparatus of the cell, c) nucleotide, d) mitochondrial DNA, e) nuclear membrane.

2. **Paramecium caudatum does not have** a) nuclei, b) pigment chlorophyll, c) digestive vacuoles, d) contractile vacuoles, e) pellicle.

3. **Human infection with malaria occurs by:** a) eating fruits and vegetables with the cysts of the parasite, b) drinking water with parasites, c) bite of the female Anopheles mosquito, d) eating poorly thermally processed beef, e) poor personal hygiene.

4. **Flatworms have no system:** a) digestive, b) circulatory, c) reproductive, d) nervous, e) excretory.

5. **The human can get fascioliasis by:** a) eating poorly thermally processed beef, b) swallowing adolesearia with water, c) eating poorly thermally processed pork, d) eating dirty vegetables and fruits, e) eating poorly thermally processed fish.

6. **The principal host of the beef tapeworm is (are):** a) snail, b) cattle, c) human, d) pig, e) cattle and human.

7. **Determine the migration path of roundworm's larvae in the human body:** a) mouth - gut - blood - heart - liver - lungs - bronchi - trachea - mouth - intestine, b) mouth - blood - liver - heart - lungs - larynx - throat - intestine, c) mouth - throat - blood - lungs - bronchi - trachea - mouth - intestine, d) mouth - intestine - blood - liver - heart - lungs - bronchi - trachea - mouth - intestine, e) mouth - intestine - blood - lungs - trachea - throat - intestine.

8. **The nervous system of arthropods is represented by:** a) neural tube at the dorsal side, b) ventral nerve chord, c) longitudinal nerve cords, d) brain and the spinal cord, e) neural tube that is on the ventral side.

9. **Representatives of the class Arachnida are:** a) louse, ixodes tick, b) spider, scorpion, flea, c) spider, scorpion, argasidae tick, d) lobster, cockroach, sarcoptic mite, e) scorpion, shrimp, grasshopper.

10. **The body of an insect is represented by:** a) cephalothorax and abdomen, b) head, thorax and abdomen, c) head and abdomen, d) trunk and tail, e) head and tail.

11. **Animals which belong to chordates are:** a) roundworms, b) amphibians, c) crustaceans, d) insects, e) arachnids.

12. **Specific sensory organs that present only in fishes are:** a) tactile organs, b) olfactory organs, c) taste organs, d) lateral lines, e) vision organs.

13. **Features of the respiratory system of the amphibian are:** a) larvae and adult individuals have lungs with thin wall, b) larvae have gills, adult individuals have lungs and skin participating in breathing, c) larvae and adult individuals breath with gills, d) skin don't participate in breathing, e) larvae have lungs, adult individuals have gills.

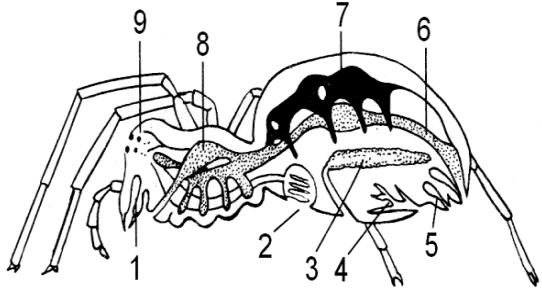
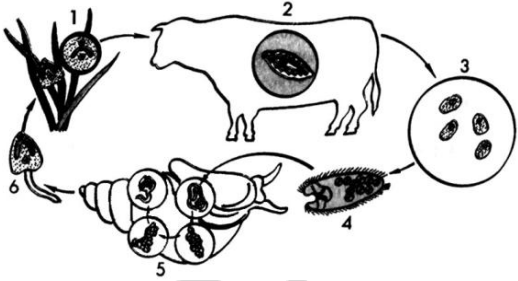
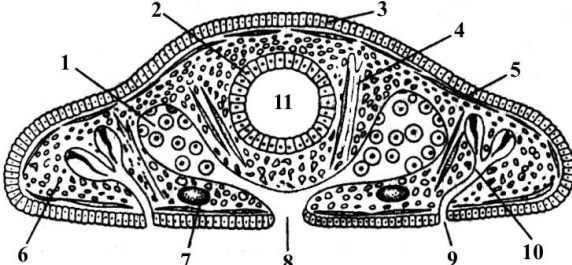
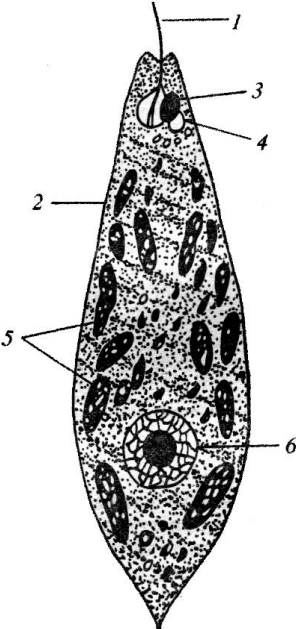
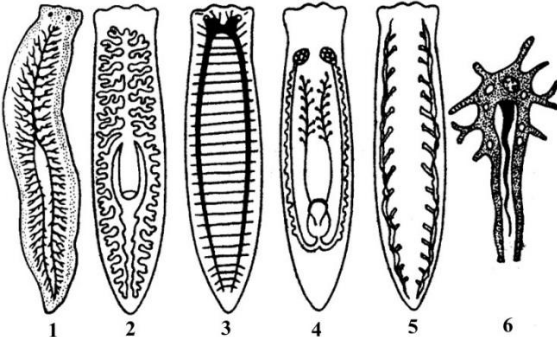
14. **Features of the reptile circulatory system:** a) two-chambered heart, b) three-chambered heart, incomplete septum in the ventricle, the brain get arterial blood, c) three-chambered heart, 1 circulation, d) two-chambered heart, 1 circulation, e) two-chambered heart, 2 circulations.

15. **Subphylum Prototheria includes:** a) bats, b) kangaroos, c) platypuses, d) elephants, e) wolfs.

II. Complete these statements and write your answers in the table:

16. Pelvic girdle of the reptile consists of ... bones.
17. A tongue of the amphibian is situated in the ... cavity.
18. The excretory system of fishes is represented by ... kidneys.
19. According to the type of dissimilation bacteria are ... and...

III. Write the answers for the questions to the table:

	
<p>20. What is indicated with «2» in the figure?</p>	<p>21. What is indicated with «4» in the figure?</p>
	
<p>22. What is indicated with «11» in the figure?</p>	<p>24. What is indicated with «6» in the figure?</p>
	<p>23. What is indicated with «1» in the figure?</p>

IV. Answer the question in writing form:

25. Reproduction and development of mammals.

Test № 4

I. Select the letter of the correct answer and write it in the table:

1. **Parasitic bacteria cause human disease such as:** a) flu and plague, b) cholera and tuberculosis, c) sore throat and flu, d) sore throat and AIDS, e) AIDS and plague.

2. **By the way of feeding (assimilation) bacteria are divided into:** a) autotrophic and heterotrophic, b) anaerobic and autotrophic, c) autotrophic and heterotrophic, d) anaerobic, e) aerobic.

3. **Paramecium caudatum excretes undigested remains of food through:** a) anal pore, b) contractile vacuoles, c) body surface, d) digestive vacuoles, e) cell mouth.

4. **Flatworms have sensory organs of:** a) touch and hearing, b) chemical and olfactory senses, c) sight and hearing, d) sight, touch and chemical senses, e) hearing and smell.

5. **Basic characteristics of fascioliasis:** a) destruction of the liver ducts and tissue, b) destruction of lung tissue, c) destruction of muscle tissue, d) destruction of the intestinal mucosa, e) pneumonia.

6. **The intermediate host of the beef tapeworm is:** a) snail, b) cattle, c) human, d) pig, e) cattle and human.

7. **The excretory system of roundworms is represented by:** a) skin glands, b) star-shaped cells with cilia, c) nephridia, d) kidneys, e) coxal glands.

8. **Limbs of arthropods do not perform functions of:** a) flying, b) locomotion, c) gripping of food, d) protection from other animals, e) sensory.

9. **Features of the circulatory system of arthropods are:** a) closed, tube-shaped heart is at the dorsal side, b) open, tube-shaped heart is at the ventral side, c) open, there is no heart, d) closed, there is no heart, e) open, tube-shaped heart is at the dorsal side.

10. **The respiratory system of insects is represented by:** a) book lungs, b) tracheae, c) book lungs and tracheae, d) gills, e) gills and tracheae.

11. **Features of lancelet's feeding are:** a) feeding is passive, food gets to the mouth with water, b) lancelets actively look for the food, c) lancelets slowly look for the food, d) lancelets actively grip the prey by tentacles, e) lancelets do not feed.

12. **Respiratory organs of fishes are:** a) tracheae, b) lungs, c) bronchi, d) gills, e) Malpighian tubules.

13. **Features of the circulatory system of the amphibian are:** a) 2-chambered heart, b) 3-chambered heart, 2 circulations, all organs are fed with arterial blood, c) 3-chambered heart, 2 circulations, the brain is fed with arterial blood, d) 1 circulation, the heart contains venous blood, e) 2 circulations, all organs are fed with mixed blood.

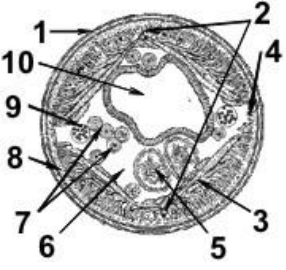
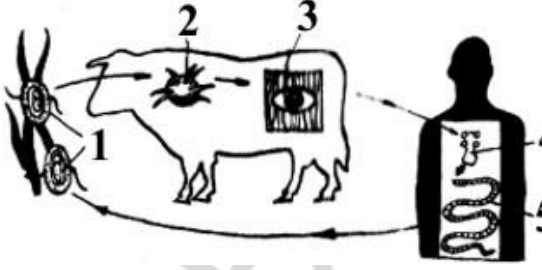
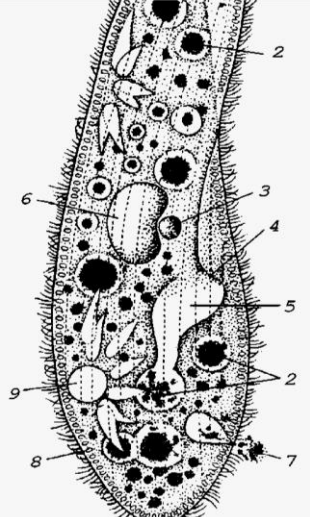
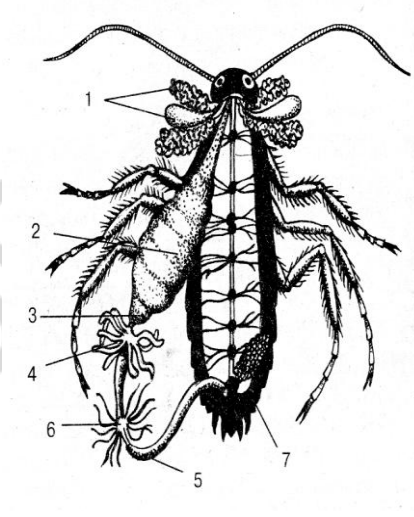
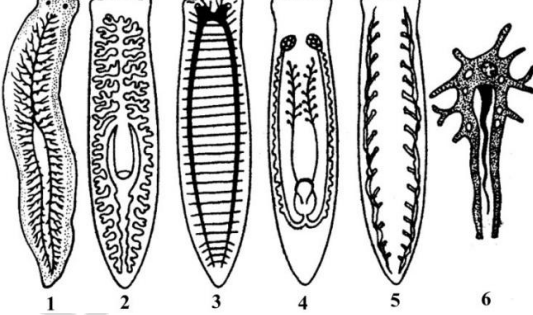
14. **Reproduction of reptiles occurs:** a) at land, fertilization is internal, b) at land, fertilization is external, c) at water, fertilization is internal, d) at water, fertilization is external, e) asexually.

15. **Muscles of mammals taking part in breathing are:** a) intercostal and dorsal muscles, b) dorsal, thoracic muscles and a diaphragm, c) diaphragm and intercostals muscles, d) intercostal muscles and muscles of the upper limbs, e) intercostal muscles and muscles of the lower limbs.

II. Complete these statements and write your answers in the table:

16. Teeth of mammals are represented by cutters, ..., molars.
 17. A chest of reptiles consists of thoracic vertebrae, ribs and...
 18. Amphibian are the first class in evolution where cervical and ... region of the spine appeared.
 19. According to the type of feeding, an Euglena is

III. Write the answers for the questions to the table:

	
<p>20. What is indicated with «2» in the figure?</p>	<p>21. What is indicated with «2» in the figure?</p>
	
<p>22. What is indicated with «7» in the figure?</p>	<p>23. What is indicated with «2» in the figure?</p>
	
<p>24. What is indicated with «6» in the figure?</p>	

IV. Answer the question in writing form:

25. General characteristics of the class Reptilia.

TEST № 5

I. Select the letter of the correct answer and write it in the table:

1. Bacterial spores perform the functions of: a) sexual reproduction, b) asexual reproduction, c) survival in a hostile environment, d) sexual reproduction and survival under unfavorable environmental conditions, e) asexual reproduction and survival under unfavorable environmental conditions.

2. Conjugation is: a) cell division in two parts, b) cell division into many parts, c) sexual process, d) form of irritability, e) allocation of liquid products of metabolism.

3. Symptoms of amoebic dysentery: a) affection of skeletal muscles, b) destruction of the intestinal wall, loose stools with blood, c) destruction of red blood cells, fever, d) destruction of liver cells, loose stools, e) inflammation of the gallbladder and duodenum.

4. The body cavity of flatworms is: a) primary, b) secondary, c) mixed, d) absent - the space between organs is filled with parenchyma, e) tertiary.

5. Larva of a liver fluke, that is formed in water from the egg is called: a) cercariae, b) oncosphere, c) measle, d) miracidia, e) redia.

6. A scolex of the beef tapeworm has: a) two suckers and hooks, b) three suckers, c) three suckers and hooks, d) four suckers and hooks, e) four suckers.

7. Conditions necessary for development of eggs of the ascaris: a) soil temperature 25 °C, humidity, b) being in the human body, c) water, temperature 15 °C, d) humidity, temperature -10 °C, e) soil, humidity, temperature 0 °C.

8. Excretory organs of arthropods are: a) metanephridia, b) protonephridia, c) skin glands and Malpighian tubules, d) skin glands only, e) Malpighian tubules only.

9. Arthropod's organs of vision are: a) simple eyes at the cephalothorax, b) compound eyes at the cephalothorax, c) simple eyes at the abdomen, d) compound and simple eyes, e) compound eyes at the abdomen.

10. The number of walking legs of insects is: a) two pairs, b) three pairs, c) four pairs, d) one or two pairs, e) two or three pairs.

11. The nervous system of the lancelet is represented by: a) brain and spinal cord, b) neural tube, c) neural cords, d) ventral nerve cord, e) supratharyngeal ganglion and ventral nerve cord.

12. The digestive system of the fish consists of: a) mouth, pharynx, stomach, b) mouth, pharynx, small and large intestines, c) mouth, pharynx, stomach, small and large intestines, d) outh, stomach, small and large intestines, e) mouth, pharynx, stomach, small intestine.

13. Features of amphibian's integument are: a) it is dry, b) it is wet, c) there are no glands in it, d) it covered with scales, e) it doesn't participate in gas exchange.

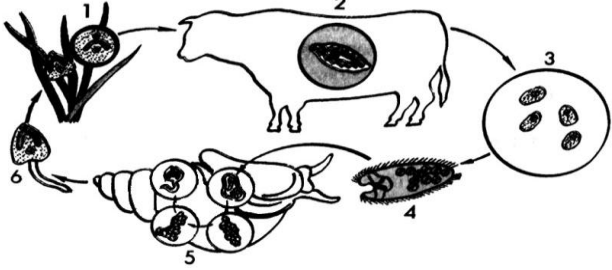
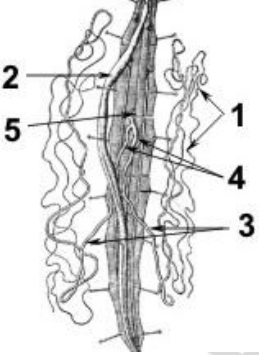
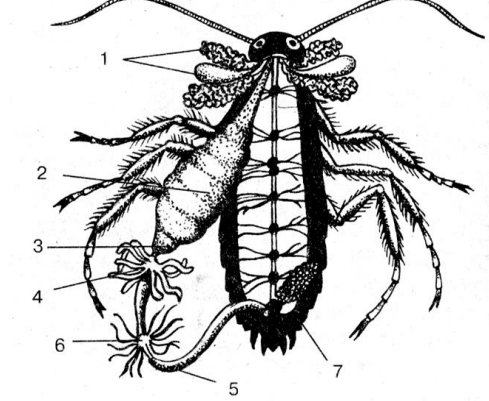
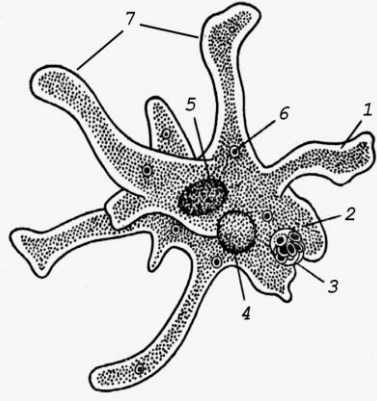
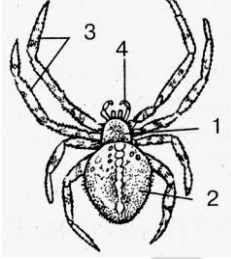
14. Features of reproduction and development of reptiles are: a) hermaphroditism, sexual reproduction, b) two genders, asexual reproduction, c) fertilization is internal, direct development, d) fertilization is internal, development goes with, e) fertilization is external.

15. Muscles of mammals taking part in breathing are: a) intercostal and dorsal muscles, b) dorsal, thoracic muscles and diaphragm, c) diaphragm and intercostals muscles, d) intercostal muscles and muscles of the upper limbs, e) intercostal muscles and muscles of the lower limbs.

II. Complete these statements and write your answers in the table:

16. Pulmonary circulation of amphibians begins from...
17. Fish organ that identify the direction of water flow is...
18. Lancelets refer to the subphylum...
19. Ixodes ticks transmit causative agents of ... and...

III. Write the answers for the questions to the table:

	
<p>20. What is indicated with «2» in the figure?</p>	<p>21. What is indicated with «1» in the figure?</p>
	
<p>22. What is indicated with «4» in the figure?</p>	<p>23. What is indicated with «7» in the figure?</p>
	<p>24. What is indicated with «1» in the figure?</p>

IV. Answer the question in writing form:

25. Significance of insects.

TEST № 6

I. Select the letter of the correct answer and write it in the table:

1. **Mezosomes perform functions of:** a) moving, b) membrane-bound organelles, c) ribosomes, d) reproduction, e) nuclear membrane.

2. **By the type of dissimilation, bacteria are:** a) autotrophic, b) heterotrophic, c) aerobic and anaerobic, d) autotrophic and heterotrophic, e) anaerobic and heterotrophic.

3. **Malaria parasite belongs to the phylum:** a) Sarcomastigophora, b) Ciliophora, c) Apicomplexa, d) Arthropoda, e) Chordata.

4. **Protists form cysts for:** a) feeding, b) breathing, c) surviving, d) conjugation, e) movement.

5. **The nervous system of flatworms is consists of:** a) cerebral ganglia and ventral nerve cord, b) cerebral ganglia and nerve cords, c) brain and spinal cord, d) brain, e) star-shaped cells.

6. **Fasciola hepatica can reach in length:** a) 3–5 mm, b) 3–5 cm, c) 1–2 cm, d) 6–10 cm, e) 10–12 mm.

7. **Hermaphroditic segments of tapeworms are located:** a) in front of the body, b) in the middle of the body, c) in the rear part of the body, d) in the front and middle of the body, e) in the middle and at the end of the body

8. **The hypodermis is a tissue:** a) epithelial, b) muscle, c) connective, d) nervous, e) muscle, covered with epithelial.

9. **Respiratory organs of arthropods are:** a) book lungs only, b) gills only, c) Malpighian tubules, d) book lungs, gills and tracheae, e) bronchi.

10. **Features of the digestive system of arthropods are:** a) 3 regions of the gut, liver ducts are open to the foregut, b) 2 regions of the gut, liver ducts are open to the midgut, c) 3 regions of the gut, liver ducts are open to the midgut, d) 3 regions of the gut, there is no liver, e) 2 regions of the gut, there is no liver.

11. **The development stage which is absent in case of incomplete metamorphosis is:** a) egg, b) larva, c) pupa, d) adult, e) larva and pupa.

12. **Regions of the reptile spine are:** a) cervical, thoracic, caudal, b) cervical, thoracic, sacral, caudal, c) cervical, thoracic, lumbar, sacral, caudal, d) cervical, thoracic, lumbar, e) thoracic and caudal.

13. **An auditory organ of reptiles consists of:** a) external and inner ears, b) an inner ear only, c) external and middle ears, d) middle and inner ears, e) external, middle and inner ears.

14. **The subphylum placentals doesn't include:** a) mice, b) hares, c) tigers, d) kangaroos, e) bats.

15. **Features of reproduction and development of fishes are:** a) separate sexes, sexual reproduction, internal fertilization, b) hermaphrodite, sexual reproduction, development occurs in water, c) asexual reproduction, development occurs in water, d) separate sexes, fertilization and development occurs in water, e) internal fertilization, development occurs in water.

II. Complete these statements and write your answers in the table:

16. Excretory organs of the lancelet are...

17. Causative agents of plague are transmitted by...

18. Scabies is caused by ... mite.

19. If the arthropod has undergone egg and larval stage then its development occurred with...

III. Write the answers for the questions to the table :

<p>20. What is indicated with «5» in the figure?</p>	<p>21. What is indicated with «4» in the figure?</p>
<p>22. What is indicated with «6» in the figure?</p>	<p>24. What is indicated with «5» in the figure?</p>
<p>23. What is indicated with «5» in the figure?</p>	

IV. Answer the question in writing form:

25. Features of the structure and vital processes of ticks.

TEST № 7

I. Select the letter of the correct answer and write it in the table:

1. **Bacteria multiply by:** a) dividing into two cells, b) division into many cells, c) forming spores, d) forming spores and dividing into two cells, e) forming spores and dividing into many cells.

2. **Bacterial cell is surrounded by:** a) capsule, b) plasmalemma, c) cell wall, d) plasmalemma and capsule, e) capsule, cell wall and plasmalemma.

3. **Heterotrophs are:** a) amoebas, b) amoebas and ciliates, c) amoebas and euglenoids, d) euglenoids and ciliates, e) ciliates.

4. **Parasitic protists don't have:** a) nucleus, b) contractile vacuoles, c) mitochondria, d) digestive vacuoles, e) ribosome.

5. **Organs of flatworms develop from germ layers:** a) ectoderm, b) ectoderm and endoderm, c) endoderm, d) endoderm and mesoderm, e) ectoderm, endoderm and mesoderm.

6. **The intermediate host of a liver fluke is:** a) only human, b) human and cattle, c) only cattle, d) cats, e) snails.

7. **Mature segments of tapeworms contain:** a) female reproductive system, b) male reproductive system, c) male and female reproductive system, d) uterus with eggs, e) all organ systems, except reproductive.

8. **The body cavity of roundworms:** a) primary, b) secondary, c) mixed, d) absent - the space between organs is filled with parenchyma, e) tertiary.

9. **The body wall of arthropods consists of:** a) hypoderm, b) dermo-miscular, c) chitin, d) skin, e) epithelium covered with cilia.

10. **Ticks transmit causative agents of:** a) scabies, b) encephalitis and influenza, c) encephalitis and typhus, d) scabies and typhus, e) influenza and scabies.

11. **Fat body of insects is:** a) digestive organ, b) collect dissimilation products, c) reproductive organ, d) part of respiratory system, e) store nutritive substances.

12. **Lancelet's excretory organs are:** a) metanephridia, b) protonephridia, c) nephridia, d) kidneys, e) Malpighian tubules.

13. **Digestive glands of amphibians are:** a) absent, b) liver and a pancreas only, c) salivary glands and the liver only, d) salivary glands, the liver and the pancreas, e) salivary glands and the pancreas only.

14. **Features of the reptile skeleton:** a) 3 regions of the spine, the chest, 2 pairs of limbs with girdles, b) 5 regions of the spine, there is no chest, c) 5 regions of the spine, 2 pairs of limbs with girdles, there is the chest, d) 2 regions of the spine, there is no chest and girdles, e) 4 regions of the spine, there is the chest, but no limbs.

15. **Breathing of mammals is provided by:** a) intercostal and dorsal muscles, b) dorsal, thoracic muscles and diaphragm, c) diaphragm and intercostals ones, d) intercostal muscles and muscles of the upper limbs, e) intercostal muscles and muscles of the lower limbs.

II. Complete these statements and write your answers in the table:

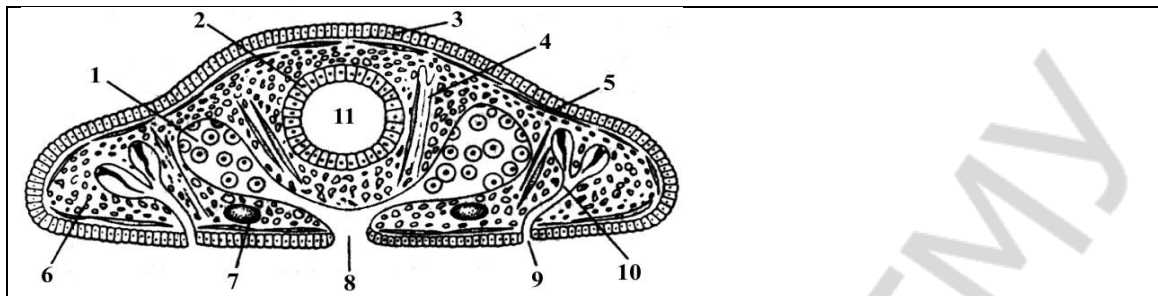
16. The main part of the central nervous system of mammals is...

17. The pectoral girdle of the reptile consists of coracoids, clavicles, scapulae and...

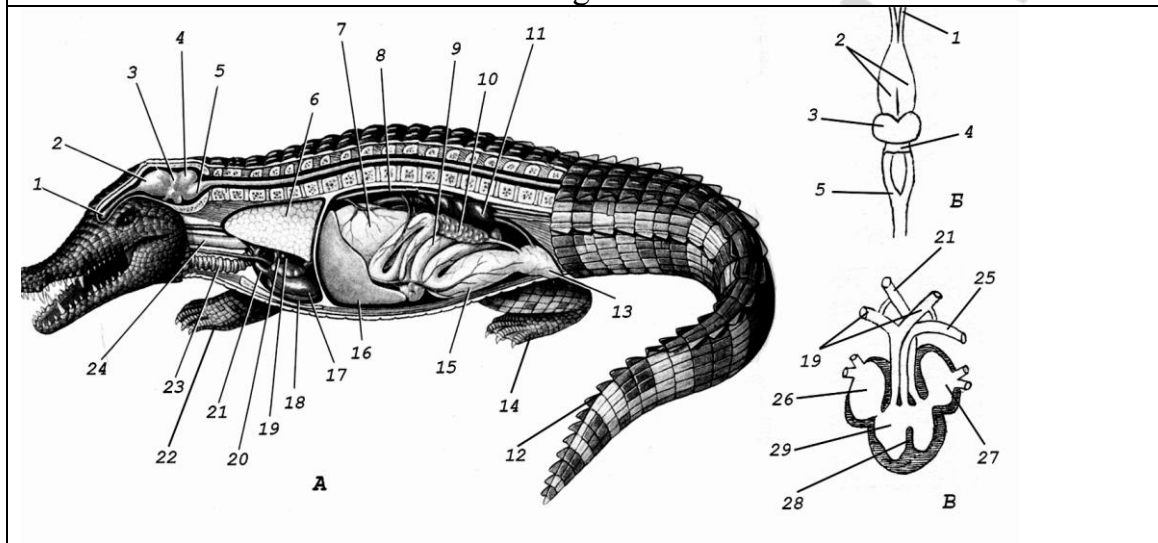
18. ... is responsible for complex behavior of insects.

19. Crawfishes belong to the class...

III. Write the answers for the questions to the table:

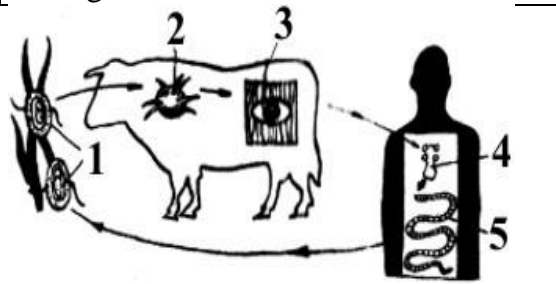
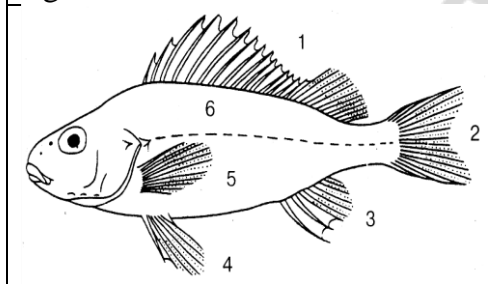


20. What is indicated with «6» in the figure?



21. What is indicated with «5» in the figure?

22. What is indicated with «28» in the figure?



23. What is indicated with «6» in the figure?

24. What is indicated with «2» in the figure?

IV. Answer the question in writing form:

25. Reproduction and development of insects.

TEST № 8

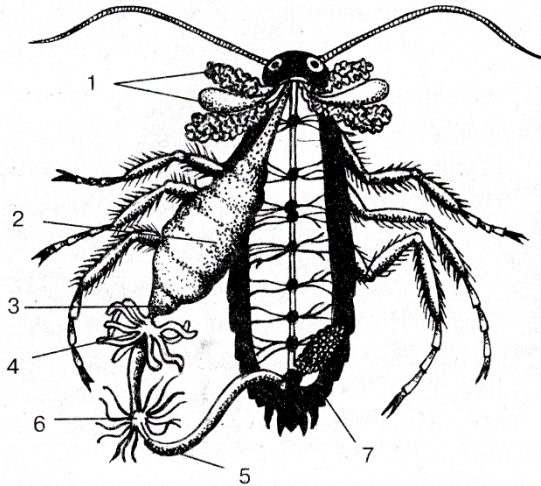
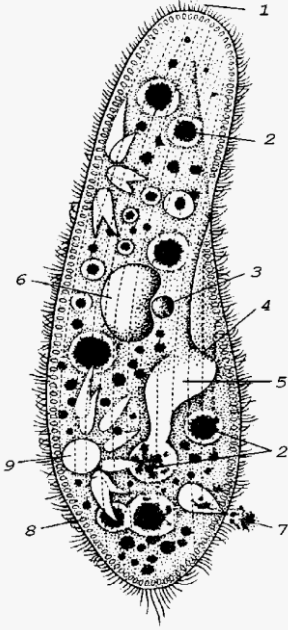
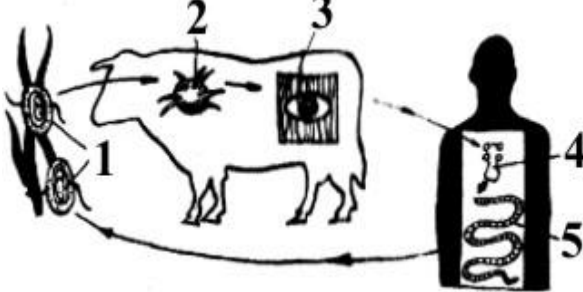
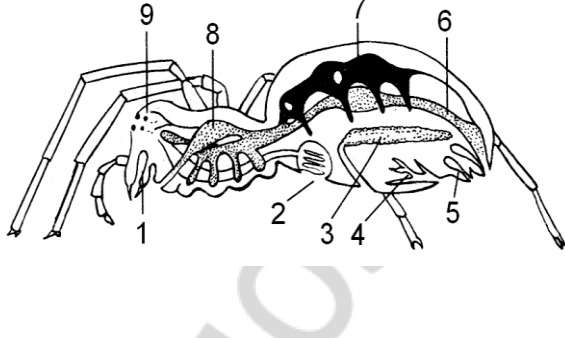
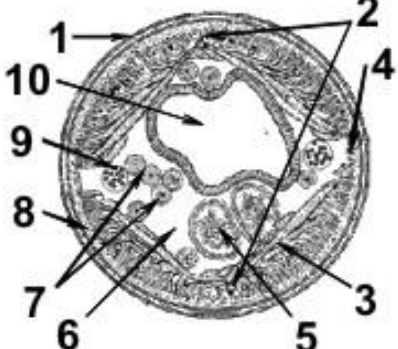
I. Select the letter of the correct answer and write it in the table:

1. **The sizes of bacterial cells:** a) 0.2–13 mm, b) 0.2–13 microns, c) 13–20 microns, d) 13–20 mm, e) 14–15 microns.
2. **Phylums of the kingdom protists are:** a) Sarcomastigophora, Ciliophora, Flukes, b) Apicomplexa, Arthropoda, c) Sarcomastigophora, Chordata, d) Ciliophora, Sarcomastigophora, Apicomplexa, e) Round worms, Ciliophora.
3. **"Updating" the genetic information in protists occurs during:** a) copulation, b) conjugation, c) asexual reproduction, d) nutrition, e) breathing.
4. **Locomotion organelles of the Euglena:** a) pseudopodia, b) cilia, c) flagella and cilia, d) pseudopodia and cilia, e) flagellum.
5. **The excretory system of flatworms is represented by** a) metanephridia, b) Malpighian tubules, c) kidneys, d) protonephridia, e) nephridia.
6. **The principal host of the liver fluke is:** a) only human, b) human and cattle, c) only cattle, d) cats, e) snails.
7. **The beef tapeworm parasitize in human's:** a) intestine, b) liver, c) liver ducts, d) lungs, e) skeletal muscles.
8. **The nervous system of roundworms consists of:** a) star-shaped cells of hypodermis, b) ventral nerve cord, c) circular nerve ring surrounding the pharynx and nerve cords, d) brain, e) brain and spinal cord.
9. **Features of the circulatory system of arthropods are:** a) closed, the heart is at the dorsal side, b) open, the heart is at the dorsal side, c) open, the heart is at the ventral side, d) arthropods do not have the heart, e) closed, the heart is at the ventral side.
10. **The number of arthropod's walking legs is:** a) two, b) three, c) four, d) five, e) six.
11. **The number of wings of insects:** a) one pair, b) two pairs, c) one or two pairs, d) three pairs, e) two or three pairs.
12. **Chewing mouthparts are typical for:** a) beetles, b) lice, c) flies, d) fleas, e) mosquitoes.
13. **The organ that replaces the notochord in higher chordates is:** a) spinal cord, b) spine, c) skeleton muscles, d) intestine, e) long bones.
14. **Features of the structure of the fish integument are:** a) fishes are covered ciliated epithelium, b) fishes have hypoderm, c) fishes are covered with scales, d) fishes do not have scales, e) fishes are covered with cuticle
15. **Features of the reptile brain:** a) consists of 5 regions, there are a well-developed cerebellum and cortex in its structure, b) consists of 4 regions, there is no cortex, c) cerebellum is developed weakly, d) consists of 3 regions, there is a well-developed cerebellum, e) medulla oblongata is absent.

II. Complete these statements and write your answers in the table:

16. Development of mammal's embryo occurs in...
17. There is a ... between the small and large intestines of reptiles.
18. The heart of amphibian's larva is...
19. There is ... blood in the fish heart...

III. Write the answers for the questions to the table:

	
<p>20. What is indicated with «7» in the figure?</p>	
	
<p>21. What is indicated with «4» in the figure?</p>	<p>22. What is indicated with «9» in the figure?</p>
	
<p>23. What is indicated with «3» in the figure?</p>	<p>24. What is indicated with «6» in the figure?</p>

IV. Answer the question in writing form:

25. General characteristics of amphibians.

TEST № 9

I. Select the letter of the correct answer and write it in the table:

1. **The forms of bacterial cells:** a) rods, triangles, b) cocci, commas, rods, c) spirals, triangles, d) commas, squares, e) squares, rods.

2. **Euglena does not have:** a) nuclei, b) pigment chlorophyll, c) digestive vacuoles, anal pore, e) contractile vacuoles.

3. **The protist that has a macronucleus is:** a) amoeba, b) euglenoid, c) ciliate, d) Giardia, e) malaria parasite.

4. **The number of layers of dermo-muscular body wall of flatworms:** a) one, b) two, c) three, d) four, e) five.

5. **Tapeworms have special organs for attachment to the body of the host:** a) cuticular lips, b) oral and ventral suckers, c) teeth, d) suckers and hooks, e) only hooks.

6. **Prevention of ascariasis:** a) personal hygiene, eating pure fruits and vegetables, b) eating a well-thermally treated pork, c) eating a well heat-treated beef, d) eating a well-processed fish, e) eating washed vegetables, fruits and good heat-treated pork and beef.

7. **Classes of the phylum Arthropoda are:** a) crustaceans, insects, arachnids, b) ticks, c) scorpions, d) beetles, e) beetles and ticks.

8. **Respiratory organs of arachnids are:** a) bronchi, b) book lungs, c) gills, d) lungs and tracheae, e) body surface.

9. **Features of the circulatory system of insects are:** a) heart is at the dorsal side of the thorax, blood is colorless, b) heart is at the dorsal side of the abdomen, blood is red, c) heart is at the dorsal side of the abdomen, blood is colorless, d) no heart, colorless blood, e) heart is at the abdominal side of the thorax, blood is colorless.

10. **Body integument of the lancelet is:** a) epidermis and dermis, b) epidermis only, c) derma only, d) skinny-muscular sac, e) cuticle.

11. **Fish body regions are:** a) cephalothorax and abdomen, b) head, thorax and abdomen, c) head, trunk and tail, d) trunk and tail, e) head and trunk.

12. **Animals that do not refer to amphibians are:** a) lizards, crocodiles, b) toads, c) newts, d) frogs, e) toads and newts.

13. **Excretory organs of reptiles are:** a) ureters that are open into urinary bladder, b) mesonephric kidneys and ureters are open into the cloaca, c) ureters, urinary bladder, and urethra, d) mesonephric kidneys, ureters are open into the urinary bladder, e) pelvic kidneys, ureters and an urinary bladder, urine is excreted through the cloaca.

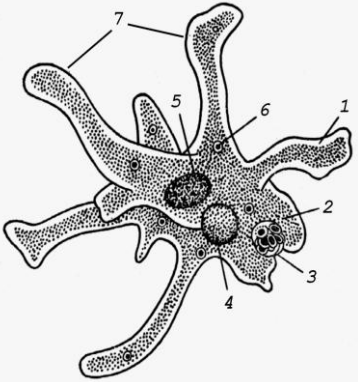
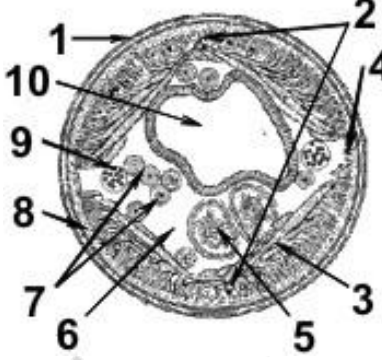
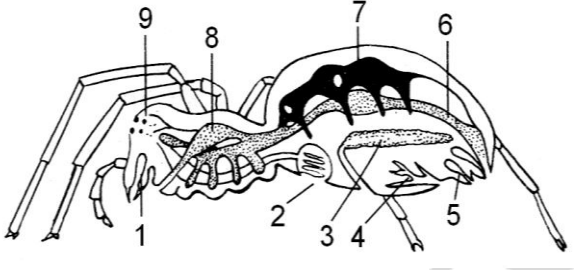
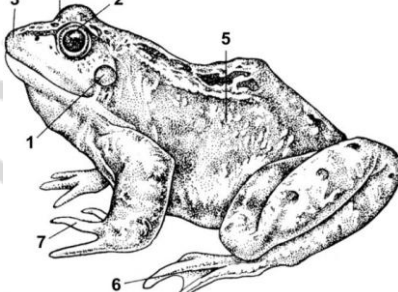
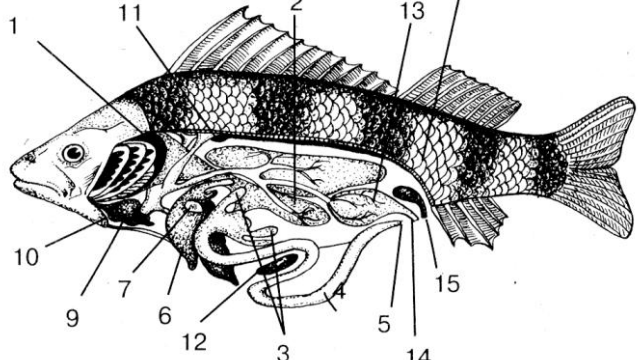
14. **Features of mammal's digestive system:** a) homogeneous teeth, intestines ends by anus, b) differentiated teeth, intestines ends by cloaca, c) differentiated teeth, intestines ends by anus, well-developed cecum, d) no stomach, homogeneous teeth, e) well-developed cecum, intestines ends by cloaca.

15. **Features of the circulatory system of mammals are:** a) four-chambered heart, 1 circulation, b) three-chambered heart, 2 circulations, c) four-chambered heart, 2 circulations, d) two-chambered heart, 1 circulation, e) three-chambered heart, 1 circulation.

II. Complete these statements and write your answers in the table:

16. A muscular septum between thoracic and abdominal cavities is called...
17. A spine of reptiles consists of ... regions.
18. Terminal part of the gut of the amphibian is called...
19. A heart of chordates is situated at the ... side of the body...

III. Write the answers for the questions to the table:

	
<p>20. What is indicated with «6» in the figure?</p>	<p>21. What is indicated with «7» in the figure?</p>
	
<p>22. What is indicated with «7» in the figure?</p>	<p>23. What is indicated with «1» in the figure?</p>
	
<p>24. What is indicated with «13» in the figure?</p>	

IV. Answer the question in writing form:

25. Characteristics of parasitic protists.

TEST № 10

I. Select the letter of the correct answer and write it in the table:

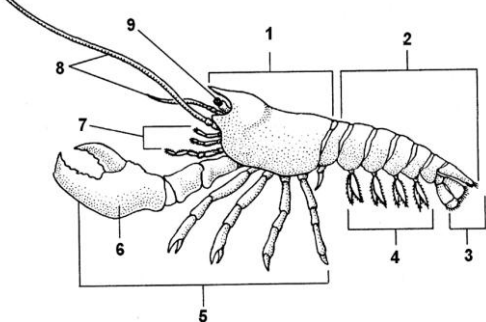
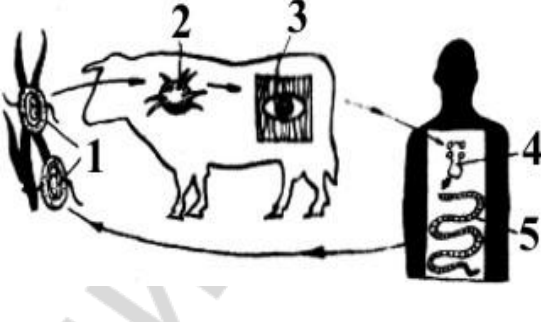
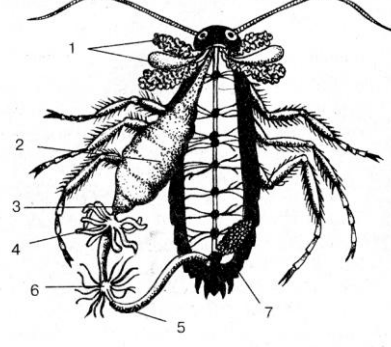
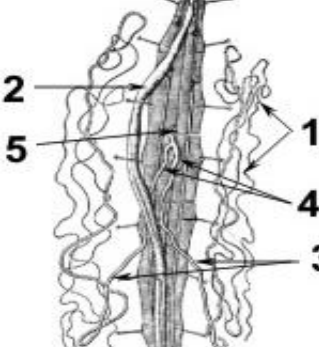
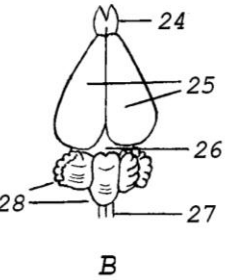
1. **Bacteria in the form of commas are called:** a) cocci, b) bacilli, c) vibrio, d) spirilla, e) vireos.
2. **Euglena is a representative of the phylum:** a) Sarcomastigophora, b) Ciliophora, c) Apicomplexa, d) Arthropoda, e) Chordata.
3. **Protists that have the green pigment chlorophyll:** a) ciliates, b) euglenoids, c) amoebas, d) ciliates and euglenoids, e) amoebas and euglenoids.
4. **Features of the digestive system of flatworms:** a) foregut, midgut and excretory pore, b) foregut, midgut, hindgut, excretory pore is absence, c) foregut, midgut, hindgut and rectum, d) foregut, midgut, excretory pore is absent, e) midgut and hindgut, excretory pore is absent.
5. **Fasciola hepatica parasitize in:** a) small intestine, b) large intestine, c) passages of the liver, d) lungs, e) skeletal muscles.
6. **The body of tapeworms consists of:** a) scolex, neck, tail, b) body and tail, c) scolex, neck, and strobila, d) scolex and strobila, e) scolex, body, tail.
7. **The sizes of the beef tapeworm are:** a) 5 m, b) 10 m, c) 10 sm, d) 3–5 sm, e) 1–2 m.
8. **Roundworms are:** a) only free-living, b) only parasites, c) free-living and plants parasites, d) free-living and animals parasites, e) free-living and plants and animal parasites.
9. **The digestive system of arthropods is represented by:** a) foregut and midgut, b) Malpighian tubules, c) hindgut, d) foregut and digestive glands, e) foregut, midgut, hindgut and digestive glands.
10. **Legs of insects are situated at:** a) head, b) dorsal side of the thorax, c) ventral side of the thorax, d) dorsal side of the abdomen, e) ventral side of the abdomen.
11. **Features of digestive system of chordates are:** a) gill slits at the anterior region of digestive tube, b) gill slits at the posterior region of digestive tube, c) linked with excretory system, d) don't linked with respiratory system, e) don't includes the esophagus and a stomach.
12. **Features of the fish circulatory system:** a) 1-chambered heart, 1 circulation, b) 2-chambered heart, 1 circulation, c) 3-chambered heart, 2 circulation, d) 3-chambered heart, 1 circulation, e) 2-chambered heart, 2 circulation.
13. **Features of the excretory system of the amphibian are:** a) mesonephric kidneys, ureters open into the urinary bladder, b) pelvic kidneys, ureters open into the cloaca, c) mesonephric kidneys, ureters open into the cloaca, d) head kidneys, ureters open into the urinary bladder, e) head kidneys, ureter opens into the cloaca.
14. **The digestive system of reptiles consists of:** a) oropharyngeal cavity with teeth and gut, b) oral cavity, pharynx, small and large intestines with rudimentary caecum, c) oral cavity, pharynx, esophagus, stomach, small and large intestines with rudimentary caecum and cloaca, d) oropharyngeal cavity, stomach, rectum and anus, e) oropharyngeal cavity, gut and cloaca.

15. Features of the circulatory system of mammals are: a) four-chambered heart, 1 circulation, b) three-chambered heart, 2 circulations, c) four-chambered heart, 2 circulations, d) two-chambered heart, 1 circulation, e) three-chambered heart, 1 circulation.

II. Complete these statements and write your answers in the table:

- 16. Only mammal's fingers have ...
- 17. Systemic circulation of amphibians begins from ...
- 18. Development of insects goes with complete and incomplete ...
- 19. An adult ascaris parasitize in ...

III. Write the answers for the questions to the table:

	
<p>20. What is indicated with «7» in the figure?</p>	<p>21. What is indicated with «1» in the figure?</p>
	
<p>22. What is indicated with «1» in the figure?</p>	<p>23. What is indicated with «1» in the figure?</p>
	
<p>24. What is indicated with «28» in the figure?</p>	

IV. Answer the question in writing form:

25. Prophylaxis of fascioliasis.

**Answer form for the control test on the subject
«Fundamentals of Cytology»**

Test №

I. Select the letter of the correct answer and write it in the table:

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
a															
b															
c															
d															
e															

II. Complete these statements and write your answers in the table:

№	
16.	
17.	
18.	
19.	
20.	
21.	

III. Write the answers for the questions to the table

№	
22.	
23.	
24.	

IV. 25. Answer the question in writing form:

**Answer form for the control test on the subject
«Fundamentals of Genetics».**

Test №

I. Select the letter of the correct answer and write it in the table:

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
a													
b													
c													
d													
e													

II. Complete these statements and write your answers in the table:

№	
14.	
15.	
16.	
17.	
18.	
19.	

III. Solve these problems and write your answer to the table:

20. Problem 1

21. Problem 2

22. Problem 3

23. Problem 4

24. Problem 5

IV. 25. Answer the question in writing form:

Репозиторий БГМУ

Answer form for the control test on the subject «Human Anatomy»

Test №

I. Select the letter of the correct answer and write it in the table:

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
a															
b															
c															
d															
e															

II. Complete these statements and write your answers in the table:

№	
16.	
17.	
18.	
19.	
20.	
21.	

III. Write the answers for the questions to the table

№	
22.	
23.	
24.	

IV. 25. Answer the question in writing form:

Answer form for the control test on the subject «Zoology»

Test №

I. Select the letter of the correct answer and write it in the table:

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
a															
b															
c															
d															
e															

II. Complete these statements and write your answers in the table:

№	
16.	
17.	
18.	
19.	
20.	
21.	

III. Write the answers for the questions to the table

№	
22.	
23.	
24.	

IV. 25. Answer the question in writing form:

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