

**MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN FEDERATION**

Federal State Autonomous Educational Institution of Higher Education

"Crimean Federal University named after V. I. Vernadsky"

Head of entrance commission

"Crimean Federal University named after V. I. Vernadsky"



**THE PROGRAM  
OF ENTRY TEST IN**

**BIOLOGY**

Simferopol' 2021

## THE PROGRAMM OF ENTRY TEST

### I. PLANTS. BACTERIA. FUNGI. LICHENS

Botany - the study of plants. The plant world as an integral part of nature, its diversity, distribution. The value of plants on Earth. Flowering plants and its structure. Vegetative and generative organs.

Root. The development of the root from primordial (embryo) root. Types of roots. Types of root systems (rod and fibrous). External and internal structure of the root in connection with its functions. Root zone. Root growth. Water and mineral salts absorption by root. Fertilizers. Root respiration. Meaning of tillage, fertilization, and irrigation of plants. Modifications of root.

The sprout. The notion of sprout. Variety of sprouts. Bud - rudimentary sprout. Generative and vegetative buds (leaf and flower). Structure of the buds. The development of bud from sprout. Sprout's growth.

Leaf. The external structure of the leaf. Venation. Simple and compound leaves. Phyllotaxy. Features of the internal structure of the leaf in relation to its functions. The respiration of leaves. Photosynthesis. Expulsion of water by leaves. Leaf fall. Significance of leaves in plant life. The role of green plants in nature and human life.

Stem. Morphological forms of stems. Branching of stems. Formation of the crown. Internal structure of a woody stem in connection with its functions: bark, cambium, wood, core. The increase in thickness of the stem. The formation of growth rings. Movement of mineral and organic substances in the stem. The value of the stem. Modified sprouts: rhizome, tuber, bulb. Their structure, biological and economic importance.

Vegetative reproduction of flowering plants. Plant reproduction by the sprouts, roots, leaves and plant in nature (as modified sprouts, stem and root cuttings, layering, dividing the bush, grafting). Biological and economic importance of vegetative propagation.

Flower and fruit. The structure of the flower: pedicel, receptacle, perianth (calyx and corolla), stamen, pistil or pistils. The structure of stamen and pistil. Uni- and bisexual flowers. Monoecious and dioecious plants. The value of the flower in the reproduction of plants. The inflorescences and their biological significance. Cross-pollination by insects, wind. Self-pollination. Fertilization. Formation of seeds and fruits. Types of fruits. Significance of flowers, fruits and seeds in nature and human life.

Seed. The structure of the seed (for example monocotyledonous and dicotyledonous plants). Chemical composition of seeds. Terms of seed germination. Respiration of seeds. Nutrition and growth of seedlings. Sowing time and depth of seeding. Distribution of fruits and seeds in nature.

Plant - the entire organism. Tissues of plant organism. Interconnection of cells, tissues and organs. The basic processes of life plants and its relationship with the environment.

Classification of flowering plants. The diversity of wild and cultivated flowering plants and their classification. Elementary concepts of systematic (taxonomic) category - species, genus, family, class. The value of international plant names.

Class Dicots. Family: Cruciferae, Rosaceae, legumes, Solanaceae, Asteraceae. Class Monocots. Families: grass, lily. The distinctive features of the plants of main families; their biological characteristics and economic importance. Typical cultivated and wild plants of these families. The impact of economic activities on the species diversity of flowering plants.



### *Main groups of plants*

Green, brown and red algae. A general characteristic of green algae. Classification. Structure and livelihoods of unicellular green algae (chlamydomonas, pleurococcus, chlorella). The filamentous algae (ulothrix, Spirogyra). The reproduction of algae. Red and brown algae. The value of algae in nature and economy.

Mosses. General characteristics. Classification. Green moss. Structure and reproduction Common haircap. Concept on sporophyte and gametophyte. Sphagnum moss, its structural features. Peat formation, its significance.

Lycopods. General characteristics. Common clubmoss (*Lycopodium clavatum*). The structure, reproduction, development cycle, significance.

Horsetails. General characteristics. Field horsetail. The structure, reproduction, development cycle, significance.

Ferns. General characteristics. The structure, reproduction, development cycle of a fern. Fossil fern, the formation of coal. Significance of ferns in nature and human life.

Gymnosperms. General characteristics. Structure and reproduction of gymnosperms (for example, pine and spruce). Male and female cones. Pollen. Ovules. Germination of pollen, pollen growth harvesting and fertilization. Manifold. Distribution of conifers, their importance in nature, and in the national economy.

Angiosperms (flowering). Adaptation of angiosperms to different conditions of life on Earth and supremacy in the modern flora. The cycle of development. Sporophyte and gametophyte in the development cycle.

The impact of human activities on the species diversity of plants. The conservation of biological diversity of plants. Red Book.

The development of flora in the world. The main stages of historical development and the complexity of the plant world on earth.

The origin of cultivated plants. The concept of the grade. The most important agricultural plants (cereals, fruit, vegetables, oil crops, technical and other). Biological basis of their cultivation. The achievements of Russian scientists in the development of new plant varieties.

### *Bacteria, fungi, lichens*

Bacteria. The structure and livelihoods of prokaryotic cells. Forms of bacteria. Reproduction of bacteria. The distribution of bacteria in the air, soil, water and living organisms. The role of bacteria in nature, medicine, agriculture and industry. Pathogenic bacteria and fight with them.

Fungi. General characteristics of fungi. Pileate mushrooms, their structure, nutrition, reproduction. The living conditions of mushrooms in the forest. Edible and poisonous mushrooms. Moulds: *Penicillium* and *Mucor*. Yeast. Fungi-parasites that cause plant diseases. The role of fungi in nature and economy.

Lichens. The structure of the lichen. Symbiosis. Food. Reproduction. The role of lichens in nature and human life.

## II. ANIMALS

Zoology - the study of animals. The value of animal in nature and human life. The similarity and difference between animals and plants. The classification of animals.

Unicellular organism. General characteristics. The habitat, features of the structure and functioning of single-celled animals, locomotion, nutrition, respiration and reproduction (for example, the amoeba, paramecium). Encystation. Green euglena - single-celled organism with animal and plants signs. The variety and importance of single-celled animals. Plasmodium - the parasite that causes malaria. The elimination of malaria as a mass disease.

Coelenterates. General characteristics of the type. Freshwater polyp Hydra. Habitat and external structure. Radial symmetry. The internal structure (two-layer, a variety of cells). Feeding. Respiration. Nervous system. Reflex. Regeneration. Vegetative and sexual reproduction. Marine coelenterates (polyps and jellyfish) and their significance.

Flat worms. General characteristics of the type. Turbellarians. White Planaria: habitat, external structure, locomotion. Bilateral symmetry. Tissues, organs, organ systems of flatworms. Feeding. Respiration. Excretion. Nervous system. Reproduction. Regeneration. Flukes and Tapeworms. Features of the structure and functioning due to a parasitic way of life. The life cycles of liver fluke and beef tapeworm. The variety of flatworms. Damage caused to animal husbandry and humans, control measures.

Roundworms. General characteristics of the type. *Ascaris lumbricoides*: the external and internal structure, feeding, reproduction and development. Prevention of ascariasis. A variety of parasitic worms and their control.

Annelids. General characteristics of the type. Class Oligochaeta.

Earthworm: habitat, external structure, tissues, skin-muscular sac, the body cavity. Digestive, circulation, excretory systems. The processes of life activity. Nervous system. Regeneration. Reproduction. The role of earthworms in soil formation. Features of classes Polychaetes and Leeches. Their importance in ecosystems. The increasing complexity of annelids in the process of evolution.

Shellfishes. General characteristics of the type. Habitat and external structure. Features of life processes. The variety of shellfish. Classes Gastropods, Bivalves and Cephalopods. Significance in nature and human life.

Arthropods. General characteristics of the type.

Class Crustaceans. General characteristics of the class. Crayfish. Habitat. The external structure. Reproduction. Internal structure. Digestive, circulatory and respiratory systems. Excretory organs. Feeding, respiration, excretion. Features of life processes. The nervous system and sensory organs. The variety of crustaceans, role in nature and human life.

Class Arachnids. General characteristics of the class. Spider *Araneus*. Habitat. The external structure. Spider net, its structure and meaning. Feeding, respiration, reproduction. Acarins. Features of the structure and functioning. The role of acarins in nature and their practical significance. Human protection measures against acarins.

Insects. General characteristics of the class. The Cockchafer (May-bug). External and internal structure. The processes of life. Reproduction. Types of development of insect. Groups endopterygota. Lepidoptera. Cabbage pierid. Silkworm. Sericulture. Diptera. Housefly, gadflies. Hymenoptera. Honey bees and ants. Instinct. Riders. The biological methods of pest control. Insects with incomplete



metamorphosis. Orthoptera. Migratory locusts - a dangerous pest in agriculture. The role of insects in nature, their practical value. Saving their species diversity.

Chordates. General characteristics of the type.

Class Lancelets. Lancelet - lower chordate. Habitat. The outer structure. Chord. Features of the internal structure. Similarity of Lancelets with vertebrates and invertebrates.

Superclass Pisces. General characteristics. Features of the external and internal structure in connection with the habitat. The nervous system and sensory organs. Reflexes, behavior. Reproduction and development. Taking care of the offspring. Class Cartilaginous fish. Morphological features. Lifestyle. Distribution. The class of Bony fishes. Differences between bony and cartilaginous fishes. The variety of fishes. Groups of fish: shark, sturgeon, Clupeiformes, carps, crossopterygian. The economic value of the fish. Fishing. Artificial breeding. Pond farms. The impact of human activities on the fish population. The need for sustainable use of fish resources, their protection (protection against pollution and others.).

Amphibians. General characteristics of the class. Frog. Features of habitat. The outer structure. The skeleton and musculature. Features of the structure of the internal organs and vital processes. The nervous system and sensory organs. Reproduction and development. The variety of amphibians and their significance. The origin of amphibians.

Reptiles. General characteristics of the class. Sand lizard. Habitat. The outer structure. Features of the internal structure. Reproduction. Regeneration. The variety of modern reptiles. Ancient reptiles: dinosaurs, therapsids (mammal-like reptiles). The origin of reptiles. The significance and protection of modern reptiles.

Birds. General characteristics of the class. Dove. Habitat. The outer structure. The skeleton and musculature. The body cavity. Features of the internal structure and processes of life. The nervous system and sensory organs. Behavior. Reproduction and development. Seasonal events in the life of birds, breeding, migrations and flights. The origin of birds. Adaptation of birds to different habitats. Birds of parks, gardens, meadows and fields. Forest Birds. Birds of prey (raptors). The role of birds in nature and their significance in human life. The role of the reserves and zoos in the conservation of rare species of birds. Attracting of birds. Poultry.

Mammals. General characteristics of the class. Domestic dog. The outer structure. The skeleton and musculature. The body cavities. Organ systems. The nervous system and sensory organs. Behavior. Reproduction and development. Taking care of the offspring. The adaptation of mammals to seasonal phenomena in nature. Orders of mammals. The origin of mammals. Yinothoria (Prototheria). Marsupials. Characteristics of Placentals: insectivores, bats, rodents, carnivores, pinnipeds, cetaceans, artiodactyls (especially the structure of the digestive system of ruminants, the breeds of cattle, pig, domestic pigs), solipeds (wild horse, breeds of domestic horses), primates. The role of mammals in nature and human life. The impact of human activities on the abundance and variety of species of mammals, their preservation.

### **III. HUMAN AND HIS HEALTH**

Human anatomy, physiology and hygiene - the sciences that studies the structure and function of the human body and the conditions of preservation of his health. Hygienic aspects of preservation of the environment.

An overview of the human body. Features of the structure and activity of cell. Basic tissues of the human body. The organs and organ systems. Connection of their structure and functions. Nervous and humoral regulation of physiological systems functions. The man and the environment.



Locomotor system. The value of the locomotor system. The structure of the human skeleton. The types of connections of bones and their significance. The composition, structure (macroscopic) and bone growth. The muscles, their structure and function. The main muscle groups. Nervous regulation of muscle activity. Movement in the joints. The reflex arc. Work of muscles. Impact of the rate and load on the work of muscles. Muscle fatigue. First aid for bruises, sprain of ligaments, dislocations and fractures. The value of exercise for the proper formation of the skeleton and muscles. Prevention of scoliosis and platypodia (flat-footedness).

Blood. The internal environment of an organism: blood, interstitial fluid, lymph. The relative constancy of the internal environment. Composition of blood: plasma, blood cells. Blood groups. The value of a blood transfusion. Blood clotting as a protective reaction. Erythrocytes and leukocytes, their structure and function. Anemia. Doctrine of Mechnikov I.I. on the protective properties of the blood. The fight against epidemics. Immunity. The significance of vaccination.

Circulation. Circulatory organs: heart and blood vessels (arteries, capillaries, veins). Greater and lesser circulation. Heart: its structure and work. Heart automatism. The concept of neural and humoral regulation of the heart activity. The movement of blood through the vessels. Pulse. Blood pressure. Lymph circulation. Hygiene of cardiovascular system. First aid for bleeding. The prevention of cardiovascular diseases. The harmful effect of smoking on the cardiovascular system.

Respiration. The value of breathing. Respiratory organs, their structure and function. Vocal apparatus. Gas exchange in the lung tissues. Respiratory motion. The concepts of vital capacity of lungs. Humoral and nervous control of respiration. Respiratory hygiene. Artificial respiration. Infectious diseases transmitted through the air. Prevention of respiratory infections. The impact of air pollution on the respiratory system.

Digestion. Nutrients and foods. Digestion: enzymes and their role in digestion. The structure of the digestive system. Digestion in the mouth. Swallowing. Works Pavlov I.P. on study activity of the salivary glands. Digestion in the stomach. The concept of neuro-humoral regulation of gastric juice secretion. Works Pavlov I.P. on gastric digestion study. The liver, the pancreas and their role in digestion. Transformation of the nutrients in the intestine. Absorption. Food hygiene.

Metabolism. Water-salt, protein, fat and carbohydrate metabolism. The dissimilation and oxidation of organic substances in the cells. Enzymes. The plastic and energy metabolism - two sides of a single process of metabolism. The exchange of substances between the organism and the environment. Food standards. The value of proper nutrition. Vitamins and their importance.

Excretion. The organs of the urinary system. Functions of kidney. Significance of excretion of metabolic products. Prevention of urinary diseases.

Skin. The structure and function of the skin. The role of the skin in the heat emission. Hardening of the organism. Hygiene of skin and clothes. First aid for heat and sunstroke, burns and frostbite.

Nervous system. The significance of the nervous system. Central and peripheral nervous system. The concept of the reflex. Structure and function of the spinal cord and the brain: the medulla oblongata, midbrain, diencephalon, cerebellum. The cerebral hemispheres: lobes and functional areas. The significance of the cerebral cortex. The concept of the autonomous nervous system.

Analyzers. Sense organs. The significance of the sense organs. The structure and function of organs of vision. Hygiene of vision. The structure and function of the organ of hearing. Hygiene of hearing.

Higher nervous activity. Unconditional and conditional reflexes. Education and biological importance of conditional reflexes. Inhibition of conditional reflexes. Role of Sechenov I.M. and Pavlov I.P. in the establishment of the doctrine of higher nervous activity; its nature. Significance of the word. Consciousness and thinking of man as a function of higher brain centers. Hygiene of physical and mental labor. Work and leisure. Sleep, its significance. The harmful effect of nicotine, alcohol and drugs on the nervous system.

Endocrine glands. The significance of the endocrine glands. The concept of hormones. Endocrine activity of the pituitary, thyroid, adrenal glands, and pancreas. The role of humoral regulation in the body. Diseases associated with disorders of the endocrine glands.

The development of the human body. Reproduction of organisms. Organs of reproductive system: structure and function. Fertilization. Fertilization and intrauterine development. Birth of a child. Newborn care. Features of the development of children and youth organisms. Personal hygiene of adolescents.

#### **IV. GENERAL BIOLOGY**

General Biology - study about the basic laws of life phenomena. Significance of biology to medicine, agriculture and other sectors of the economy.

Evolutionary theory. Brief information about the pre-Darwinian period of development of biology. The significance of the works of Linnaeus and Jean-Baptiste Lamarck. The main statements of the Charles Darwin's theory of evolution. The significance of the theory of evolution for the development of natural science.

Population - a unit of the species and evolution. The concept of plant types and animal breed.

The driving forces of evolution: heredity, struggle for existence, variation, natural selection. The leading role of natural selection in evolution. Forms of natural selection. The mechanism of adaptation. The relative nature of adaptation.

Artificial selection and genetic variation - the basis of breeding of breeds of domestic animals and types of cultivated plants. The creation of new highly productive breeds of animals and types of plants.

Microevolution. Formation of species - the result of microevolution. Ways of formation of species. Species: the criteria and structure of species.

Macroevolution. The emergence of supra-species taxa. Forms of phylogenesis: phyletic evolution, divergent evolution, parallelism, convergence. The concept of the speed of evolution. The relationship between micro- and macroevolution. The adaptive nature of evolution.

The main directions of evolution (aromorphosis, idioadaptation, degeneration). Biological progress and regress (Severtsov A.N.). The extinction of species as a result of biological regression. Ways to achieve biological progress. Results of evolution: organic expediency, adaptation of organisms, species variety, the gradual complication of the organization.

Plant and animal system – representation of evolution. The principles of the modern classification of organisms. Taxonomic units.

Using the theory of evolution in agricultural practices and the protection of nature.

The development of the organic world. Evidence of evolution of the organic world: comparative anatomical (homology and analogy, rudiments and atavisms, transitional forms); comparative



embryological (similarity of vertebrate embryos at the early stages of development, the biogenetic law, and modern ideas about it); relatively-paleontological (fossil transitional forms, phylogenetic series). The division of the earth's history into eras and periods. The main directions of evolution. The ratio of the different directions of evolution. A brief history of the development of the organic world. Main aromorphoses in the evolution of the organic world. The main directions of the evolution of angiosperms, insects, birds and mammals in the Cenozoic era. The impact of human activities on natural communities, their protection.

The origin of life on Earth. The definitions of the concept of "life". A.I. Oparin's hypothesis about the origin of life. Abiotic synthesis of organic compounds.

Origin of human. Charles Darwin theory of the origin of man from animals. The driving forces of anthropogenesis: social and biological factors. The leading role of the laws of social life in the social progress of mankind. Ancient humans and fossil modern men. The human race, their origin and unity. Unscientific, reactionary nature of social Darwinism and racism.

Fundamentals of Ecology. Subject, matter and tasks of ecology, mathematical modeling in ecology. Habitat. Ecological factors: abiotic, biotic and anthropogenic. Laws of influence of environmental factors on the organism. Limitation factors. Features of the aquatic, terrestrial and air, soil and organism habitats. Adaptation of organisms to life in different habitats. Human activity as environmental factor. The combined effects of factors on to the organism. Adaptation of plants and animals to seasonal rhythms. Seasonality in nature. Condition of winter dormancy. Cold-resistance. Factors that control the seasonal development. Photoperiodism.

The ecological characteristics of species and populations (size, density, fertility, mortality, population growth, the growth rate). Population structure: gender, age, spatial and behavioral. The dynamics of population size. Survival curves. Factors causing changes in population numbers, ways of its regulation. Relations between individuals in populations. Rational use of species, the preservation of their variety.

Community or biocenosis (phytocoenosis, zoocenoses, microbiocenosis). Biotope (ecotope). Concepts biogeocoenosis and ecosystem. Species, spatial and trophic structure of the ecosystem. The ecological niche. The components of the ecosystem (producers, consumers, decomposers). Food chains and trophic nets. Types of food chains. Rules of the ecological pyramids. Self-regulation and the stability of ecosystems. Replacement of ecosystems. Agroecosystems. Ways to increase productivity of agroecosystems through land reclamation, implementation of new technologies on growing plants. Protection of ecosystems.

Biosphere theory. Fundamentals of the biosphere theory. The layers of the biosphere. V.I. Vernadsky's theory of biosphere. The biomass of the land surface, oceans and seas, soil. Living matter, its gas, concentration, oxidizing and reducing functions. Circulation of materials and conversion of energy in the biosphere. Biogenic migration of atoms. Role of microorganisms. Biosphere in scientific and technological progress. Human role in nature. The concept of the noosphere. Environmental problems: protection against pollution, species variety, ecological communities, landscapes.

Basics of cytology. The main statements of the cell theory. The cell - structural and functional unit of living things. The content of the chemical elements in the cell. Water and other inorganic substances, their role in the cell life. Organic substances: lipids, ATP, biopolymers (carbohydrates, proteins, nucleic acids), their role in the cell. Enzymes and their role in life processes.



The structure of the eukaryotic cell. The cell wall and the cell membrane: structure and function. Cell protoplast and cytoplasm. The nucleus: structure and function. Chromosomes and chromatin. Membranous cell organelles: endoplasmic reticulum, Golgi apparatus, lysosomes, vacuoles, mitochondria and plastids. Non-membranous cell organelles: ribosomes, cytoskeleton, cell center, organelles of locomotion. Cell incorporations. Features of the structure of prokaryotic cells. Comparative characteristics of the structure of plant and animal cells.

Metabolism and transformation of energy - the basis of cell activity. The classification of organisms due to the energy source and feeding type. Energy metabolism in the cell and its essence. The significance of ATP in energy metabolism. Plastic metabolism. Photosynthesis. Chemosynthesis. Ways to increase productivity of agricultural plants. Biosynthesis of proteins. Gene and its role in the biosynthesis. DNA code. Matrix synthesis reactions. Relationship of processes in plastic and energy metabolism.

Noncellular forms of life (viruses). Features of their structure and functioning. Human viral diseases. Prevention of AIDS.

Reproduction and development of individual organisms. The somatic and germ cells of a multicellular organism. The chromosomes, haploid and diploid set of chromosomes. Homologous chromosomes.

Cell cycle. Interphase. The mechanism and the biological significance of mitosis. Meiosis - reduction division, mechanism and biological significance.

Spermatogenesis and oogenesis in animals. Fertilization in animals. Double fertilization of flowering plants.

Ontogenesis. The development of the embryo (animal example). Post-embryonic development. Direct and indirect postembryonic development. Forms of organisms reproduction: asexual and sexual. The methods of asexual reproduction (mitosis, sporulation, fragmentation, gemmation (budding), vegetative reproduction). Sexual reproduction of organisms. Parthenogenesis. Hermaphroditism.

Fundamentals of Genetics. Subject, tasks and methods of genetics. The basic laws of heredity and variation of organisms and their cytological bases.

The mono- and dihybrid cross. The laws of heredity established by Mendel. Dominant and recessive traits. Allelic genes. Phenotype and genotype. Homozygote and heterozygote. The uniformity of the first generation. The intermediate nature of inheritance. Law of segregation of characters. The statistical nature of cleavage events. Cytological bases of uniformity of the first generation and segregation of characters in the second generation. The law of independent inheritance and its cytological bases. Linked inheritance. Crossingover. Genotype as an integral system of historically established. Genetics of sex. The chromosomal theory of heredity. Hereditary diseases of man. The significance of genetics in medicine and public health. The harmful effect of nicotine, alcohol and other drugs on human heredity.

Role of genotype and environmental conditions in the formation of phenotype. Modification variability. The norm of reaction. Statistical patterns of modification variability.

Mutations and their causes. N.I. Vavilov's law of homology series in genetical mutability. Experimental modeling of mutations. Mutations as a material for artificial and natural selection. Mutagenic pollution of the environment and its consequences.

Genetics and evolution theory. Population genetics. Forms of natural selection.

Fundamentals of selection. Breeding as a science, its tasks. The significance of works of N.I. Vavilov for the development of breeding. The significance of the starting material for breeding. The genetic basis of plant, animal and microorganism breeding.

Plant breeding. The main methods of selection: hybridization and artificial selection. The role of natural selection in breeding. Self-pollination of cross-pollinated plants. Heterosis. Polyploidy and distant hybridization. Achievements of plant breeding.

Animal breeding. Types of crossbreeding and rearing methods. Method of analysis of hereditary agronomic traits in animal producers. Distant hybridization of domestic animals.

Selection of bacteria, fungi, its importance for the microbiological industry (production of antibiotics, enzymes, nutrient yeast and other). The main directions of biotechnology (microbiological industry, gene and cell engineering).



### Examples of tests for entrance exam

1. Four long and two short stamens are found in

- Asteraceae
- Liliaceae
- Solanaceae
- Brassicaceae

2. Nitrogenous base that occurs in RNA but not in DNA

- Uracil
- Cytosine
- Thymine
- No correct answer

3. A nitrogenous base that occurs in DNA in equal quantities with guanine

- Deoxyribose
- Ribose
- Uracil
- Cytosine
- Thymine

4. Which one of the followings belongs to platyhelminthes? Chouse all correct answers

- Plasmodium
- Schistosoma
- Trypanosoma
- Wuchereria
- Echinococcus

5. Reptiles normally have a heart that is:

- a) two-chambered; b) three-chambered as in amphibians; c) four-chambered; d) three-chambered, but with an incomplete ventricular septum.

6. Egg-laying mammals are characterized by:

- a) live birth; b) mammary glands; c) nipples; d) placenta.

7. Which muscles in the human body form the walls of blood vessels, intestines, and stomach:

- a) striated; b) smooth; c) mixed; d) organs listed have no muscular tissue.

8. Which blood cells do not have a nucleus in their cells?

- a) leukocytes; b) erythrocytes; c) lymphocytes; d) none of the blood cells have nuclei.

9. The respiratory center is located:

- a) in the midbrain; b) in the medulla; c) in the spinal cord; d) in the midbrain and medulla.

10. New species are formed by:

- a) crossingover; b) macroevolution; c) microevolution; d) ontogenesis.

11. The most acute and intense form of interspecific struggle for existence is:

- a) predation; b) parasitism; c) competition; d) tenancy.

12. Which of the following adaptations can be considered an idioadaptation?

- a) transformation of cactus leaves into thorns; b) loss of circulatory organs in flatworms; c) the emergence of warm-bloodedness; d) bipedalism in humans.

13. Specialized cells, responsible for sexual reproduction, are called:

- a) gametes; b) spores; c) blastomeres; d) oocytes.

14. Connect the plant with the family:

1	Caryopsis	a	Rosaceae
2	Strawberry	b	Gramineae
3	Capsula Pod	c	Cruciferae
4	Bean	d	Solanaceae
5		e	

15. Connect animals with their traits:

1	River crayfish	a	Cord remains throughout its life
2	May beetle	b	Five pairs of walking legs
3	Cross-legged spider	c	No whiskers, 4 pairs of eyes
4	Lancet	d	Body is covered with a mantle
5		e	

16. Identify the relationship between blood types and their determinants:

1	I	a	Erythrocytes contain only agglutinogen A
2	II	b	Erythrocytes contain agglutinins A and B
3	III	c	Blood plasma contains agglutinins $\alpha$ and $\beta$
4	IV	d	Blood contains plasma and erythrocytes
5	Characteristic of all groups	e	Blood plasma contains only agglutinin $\alpha$



## Entry test evaluation criteria

The entrance test is conducted in test form on the digital platform of "Crimean Federal University named after V. I. Vernadsky": <https://en-exams.edcampus.ru>.

The assignment consists of three parts:

I. Choose one correct answer from the proposed variants of the question. There are **10 questions** in this part of the test assignment; for a correct answer to one question - **4 points**. The maximum possible score for this kind of task is **40 points**.

II. Two correct answers must be chosen from the multiple-choice questions. There are **3 questions** in this test form; for a correct answer you will get **5 points**. The maximum possible score for this kind of test task is **15 points**.

III. You are offered three blocks of tests with five matches in each block. You will get **3 points** for one correctly completed match. Maximum possible score for this kind of test is **45 points (15 points for a block of matches)**.

Time for test tasks - 45 minutes.

The total maximum number of points if all the tasks are completed correctly is **100 points**.

Head of chemistry exam commission

S.F. Kotov

First Vice-Rector



Vladimir O. Kurianov