

CONFIRMED
at the Admissions Committee meeting
Ivan Horbachevsky Ternopil
National Medical University
of the Ministry of Health Of Ukraine
«26» 05 2020, minutes № 8.
The Head
of the Admissions Committee
Acting Rector prof. Arkadij Shulhai



SYLLABUS
the entrance exams on Biology

EXPLANATORY NOTE

Program for the entrance exams on Biology was created in accordance of biology course, which is provided the study curricula of secondary schools, the state standard basic and secondary education (approved by the Government of Ukraine of 14.01.2004 № 24 p.) And "Program for independent external Evaluation of biology "(the Ministry of Education and Science of Ukraine 01.10.2014 № 1121).

Knowledge of discipline "Biology" includes:

- formation of knowledge about the principles of operation and structure of biological systems, their ontogenesis and phylogeny, relationships between biological systems, the environment; mastering the methodology of scientific knowledge;
- developed skills to establish harmonious relationship with nature based on respect for life as the highest value and all life as a unique part of the biosphere;
- development of mental abilities and personality traits (cognitive interest, observation, imagination, attention, memory, theoretical thinking style), the desire for self-education, self-improvement, self-fulfillment in different activities;
- mastering the technology decision-making, free choice and action in the areas of life where overlapping problems of man as a living being, society and the environment;
- formation of a scientific outlook; forming emotional and value attitude to nature, to themselves, to people, to universal spiritual values.

LIST OF REQUIREMENTS

Biology - the science of nature

The value of biology in human life. The diversity of living organisms, their habitats, classification. The study of biological objects.

Part 1. Human Biology

The value of the knowledge about of human to maintaining health. The origin of man. Features of the specie Homo sapiens.

The human body as a biological system. The concept of biological systems. Cellular structure of the human body. Characteristics of the tissue. Authorities. Physiological systems in human organs. The regulatory system of the human body.

Musculoskeletal system. Structure and function of the musculoskeletal system. Bone and cartilage tissue. The development of bone. Connections bones. The structure of the human skeleton. Structure and function of skeletal muscles. Types of muscles. The mechanism of muscle contraction.

Blood and lymph. The internal body fluids person. Composition and functions of blood. Protective function of blood. Immunity. The specific and nonspecific immunity. Blood clotting.

Blood circulation and lymph circulation. Circulation organs: heart and blood vessels. Structure and function of the heart. Vascular system, its structure. The movement of blood through the vessels. Large and small circulation. Regulation of blood supply. Lymph and its value.

Breathing. The value of breathing. Structure and function of the respiratory system. Voice apparatus. Respiratory movements. Gas exchange in lungs and tissues. Neurohormonal regulation of breathing.

Nutrition and digestion. The energy needs of the body. The types of nutrients. Nutrition and health. Structure and function of the digestive system, digestive glands. Digestion in the small intestine. The functions of the large intestine. Regulation of digestion.

Thermoregulation. Support body temperature. Heat. Structure and function of the skin. The role of the skin in thermoregulation.

Excretory system. Structure and function of the urinary system. Human kidney. Regulation of water in the body.

Part 2. The molecular level of life

The elemental composition of organisms. Classification of chemical elements according to their content in the body (macronutrients, including organogenic elements,

trace elements). The consequences of inadequate or excess intake of human chemical elements (I, F, Fe, Ca, K) and how to resolve their shortage. Endemic diseases.

Inorganic compounds in the body. The role of water, salts and other inorganic compounds in the body. Hydrophilic compounds. Hydrophobic compounds.

Organic compounds in organisms. Structure, properties and function of organic compounds. The concept of biopolymers and their monomers.

Carbohydrates: monosaccharides, oligosaccharides, polysaccharides. Features of the structure, basic features and functions in the bodies of living creatures.

Lipids, basic features and functions in living organisms.

Proteins: structure features. Amino acids, peptides and polypeptides. Levels of structural organization of proteins. The properties of proteins. Denaturation, renaturation, destruction of proteins. The functions of proteins in living creatures. Enzymes, their structure, properties and applications of human activities.

Nucleic acid. Structure, nucleotides. Structure, properties and function of DNA, the principle of complementarity. The concept of the gene. RNA and their types. ATP and its high-energy bonds.

Biologically active substances (vitamins, hormones, neurohormones, plant hormones, alkaloids, phytoncides, their biological role.

Part 3. The cellular level of life

Cell. The study of cells. Methods cytological studies. The structure of prokaryotic and eukaryotic cells. The cell membranes. The surface unit cell - a system of contact with the environment, its functions. The structure and functions of the nucleus. Nucleoid of prokaryotic cells.

Cytoplasm and its components. Cytosol, ribosomes. Protein synthesis. Cytoskeleton. Organelles: endoplasmic reticulum, Golgi apparatus, lysosomes, vacuoles, the mitochondria and the process of respiration and photosynthesis plastids.

The cell as a complete system. The cell cycle. Mitosis. Meiosis. Karyotype. Metabolism and energy in the cell. Modern cell theory. Cytotechnology.

CRITERIA OF EVALUATION, STRUCTURE OF EVALUATION AND PROCEDURE FOR EVALUATION OF PREPARATION

1. Entrance tests are conducted in the form of an entrance exam or a professional test by writing a test test.

2. Each exam paper of a written test exam includes 24 tests from a particular subject of competition. The assessment is based on a 200-point scale of 100 to 200.

3. For each test, the task of the exam paper of a written test exam is evaluated as follows:

5/10 points - the correct answer to the question;

0 points - the answer is incorrect, missing or more than one answer is selected.

4. It is considered that the applicant successfully passed the exam if he gave 13 or more correct answers in accordance with the Table, and the number of scored points is, respectively, 120 and more, in addition to the entrants mentioned in paragraph 4.1.

4.1. It is believed that the entrants (on the basis of complete secondary education) who submitted applications in specialty 221 "Stomatology", 222 "Medicine", successfully passed a written test exam and admitted to the competition if they gave 16 or more correct answers in accordance with the Table, and the number of points scored on a 200-point scale is, respectively, 150 and more.

5. The score, which is the result of the exam, is the number of correct answers to a ticket from 24 test questions translated on a scale from 100 to 200 points in accordance with the Tables.

6. The entrant's competitive bout, which calculates the position of the entrant in the rating list and which is entered into the UNESCO, is calculated taking into account weighting coefficients for each subject of competition, established by the Rules of admission.

Criterion table for the transfer of the number of correct answers given in the 200-point scale

The number of correct answers	The number of points awarded to the entrant on a 200-point scale
1	did not make
2	did not make
3	did not make
4	did not make
5	did not make
6	did not make
7	did not make
8	did not make
9	did not make
10	did not make
11	did not make

12	did not make
13	120
14	130
15	140
16	150
17	160
18	170
19	175
20	180
21	185
22	190
23	195
24	200

References:

1. Biology. – Sylvia S. Mader, Wm. C. Brown Publishers: Dubuque, Iowa – Melbourne, Australia – Oxford, England, IV edition. – 850 p.
2. Biology. Art notebook – Sylvia S.Mader, Wm. C. Brown Publishers: Dubuque, Iowa – Melbourne, Australia, 1995. – Oxford, England, IV edition. – 205 p.
3. Biology of the Invertebrates. – Yan A. Pechenik: Boston, Massachusetts, III-th edition. –557 p.
4. Introduction to Cell and Molecular Biology – Stephen L. Wolfe: Wadsworth Publishing Company, 1995 – 820 p.
5. Human Biology. – Jack Carey, 1995. – 527 p.