

Ministry of Health of Ukraine
Ivano-Frankivsk National Medical University

APPROVED
Head of Admission Committee
Ivano-Frankivsk National Medical University
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(signature)

Program and Assessment System
of complex entrance spoken exam in Biology and English
(language of study – English)
for foreigners and people without citizenship

EXPLANATORY NOTE

The purpose of the complex entrance examination is to assess the knowledge of foreigners in two subjects: Biology and English.

Complex entrance examination takes place in oral form. When taking a complex entrance exam, the entrant must answer one question in each subject. The results of the answer for each subject are evaluated by a scale from 100 to 200 points. For each subject, the entrant must receive at least 100 points. If the entrant's answer is evaluated at least in one subject less than 100 points, then such applicants are not allowed to participate in the competitive selection.

The content of the program material for a complex entrance exam consists of two parts that correspond to the names of the subjects: 1) Biology; 2) English.

Each part of the program material contains criteria for evaluating the answers of applicants.

PROGRAM MATERIAL CONTENT

EDUCATIONAL SUBJECT: BIOLOGY

Applicant must **KNOW**:

- ☐ main signs of living, level of life organization, organisms elemental composition;
- ☐ inorganic and organic compounds of organisms, metabolism and energy transformation;
- ☐ structure and function of cells, cell division;
- ☐ the structure and function of viruses, prions, viroids, bacteria;
- ☐ structure and processes of plant life, the variety of plants;
- ☐ structure and function of fungi, lichens;
- ☐ the structure and function of animals, the variety of animals.
- ☐ the structure and functions of the human body;
- ☐ reproduction of organisms, individual development of organisms, basis of selection;
- ☐ historical development of the organic world;
- ☐ the basic laws of heredity and variability;

Applicant **MUST BE ABLE**:

- to characterize the basic biological concepts, laws and theories, biological phenomena and processes;
- to compare the processes of life at different levels of the organization (molecular, cellular, organismic, population-species, ecosystem, biosphere) and to identify the relationships between them;

- to establish causal, functional, structural connections in wildlife, to classify objects;
- to apply biological knowledges to analyze situations that arise in different spheres of life;
- to carry out calculations using the mathematical apparatus;
- to substantiate the conclusions.

MAIN SECTIONS

INTRODUCTION. GENERAL BIOLOGY

Biology is a science about living nature. The main signs of the living. Levels of life organization: molecular, cellular, organism, population-specific, ecosystem, biosphere.

1. MOLECULAR LEVEL OF LIFE ORGANIZATION.

Elemental composition of organisms. Classification of chemical elements according their content in organisms.

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

Organic compounds of organisms. Structure, properties and functions of organic compounds.

Carbohydrates: monosaccharides, oligosaccharides, polysaccharides.

Lipids. Features of the structure, basic properties and functions in organisms.

Proteins: structural features. Amino acids, peptides and polypeptides.

Enzymes, their structure and properties.

Nucleic acids. Structure, properties and functions of DNA. The concept of the gene. RNA and their types.

Division of cells. The mitotic division of cells into eukaryotes, its phases. Meiotic cell division, its phase.

Metabolism and energy conversion. Metabolism. Assimilation and dissimilation.

Biosynthesis of proteins and its stages. Genetic code and its properties.

Transcription. Genes (structural and regulatory). Exons and introns.

Photosynthesis. The main processes occurring in the light and dark phases of photosynthesis.

2. CELLULAR LEVEL OF LIFE ORGANIZATION.

Organization of cells. Modern Cell Theory.

Membranes, their structure, properties and basic functions. Plasma membrane. Transport of substances through membranes.

Cytoplasm and its components.

Organelles. Unicellular organelles: Endoplasmic Reticulum, Golgy apparatus, lysosomes, vacuoles. Double membrane organelles: mitochondria, plastids and their types (peculiarities of their structure and functions). Non-membrane organelles: ribosomes, polyribosomes, cell center, organelle movements.

Nucleus, its structure and functions.

Chromosomes, their structure and chemical composition. Human kariotype.

Division of cells. The mitotic cell division, its phases. Meiotic cell division, its phases.

Metabolism and energy conversion. Assimilation and dissimilation.

Protein synthesis and its stages. Genetic code and its properties. Transcription. Genes. Exons and introns.

Photosynthesis. The main processes occurring in the light and dark phases of photosynthesis. The value of photosynthesis.

3. UNCELLULAR FORMS OF LIFE.

Viruses, prions. Viruses, their chemical composition, structure and reproduction. The mechanism of viruses penetration into the organism. Role of viruses in nature and human life.

4. ORGANIZMIC LEVEL OF LIFE ORGANIZATION.

Bacteria. General characteristics of prokaryotes (bacteria, cyanobacteria). Pathogenic bacteria and diseases caused by them. Prevention of bacterial diseases.

Plants. General characteristics of Plant kingdom. Classification of plants.

The structure of plant organism. Features of unicellular and multicellular plants organization. Tissues of multicellular plants.

Vegetative organs of plants. Root and its features. The structure of the root. Types of the root. The root system and its types (rod, blubber).

Sprout and its functions. Structure of sprout.

Stem and its functions. Inner structure of a stem.

Leaf, its structure and functions.

The bud is the germ of the stem. The structure of the bud.

Generative organs of Angiospermae: (flower, seed, fruit).

Flower is an organ of sexual reproduction of plants. The structure and functions of the flower. Inflorescences, their biological significance.

Seed and Fruit. Structure and function. Seed and fruit development.

Life processes, reproduction and development of plants. Nutrition of plants (mineral nutrition, air supply - photosynthesis). Breathing of plants. Transpiration.

Forms of reproduction of plants: sexual and asexual. Spores. Fertilization.

Variety of plants.

Green algae: unicellular (chlorella, chlamydomonade) and multicellular (spirogira, ulva, ulotrix).

Brown algae (laminaria, fucus).

Red algae (phyllophora, porphyry, coral).

Diatomaceous algae (navicula, pinnularia).

Vascular spore plants (Lycopodiales, Equisetales, Pteropsida)

Phylum Gymnospermae (ginkgo, berry thistle, thuja, pine, spruce, larch, juniper, cedar, velvichia, stalk).

Angiospermae. Classification of angiospermae. Monocotyledones and Dicotyledones Classes.

Fungi. Lichenes.

General characteristics of the Fungi kingdom. A variety of fungi.

Lichenes – symbiotic organisms. A variety of Lichenes.

Animals. General characteristics of Animal kingdom. Principles of animal classification. Animal tissues.

Unicellular animals. General characteristics. Features of the structure and processes of life.

Freshwater (amoeba proteus, euglena green, infuzoria-shoe) their role in nature and human life.

Symbiotic unicellular animals: parasites (dysentery amoeba, trypanosomes, malaria plasmodiae).

Multicellular animals. Characteristic features of multicellular animals, their difference from unicellular.

Phylum Coelenterata or Cnidaria. General characteristics of the type.

Phylum Flatworms. General characteristics of the type. Class Fluck (liver fluck), features, distribution, structure and processes of life. Class Cestodeae (Taenia solium and Taenia saginata), peculiarities of distribution, structure and processes of life.

Phylum Roundworms (nematodes). General characteristics of the type. Round worms - parasites of plants, animals and humans (Ascaris, Enterobius, Trichinella), diseases that they are caused.

Phylum Carnivorous worms. General characteristics of the type.

Phylum Mollusca. General characteristics and variety of the type.

Phylum Arthropoda. General characteristics of the type. Variety of arthropods.

Class Crustaceae. General characteristics, features of external and internal structure.

Class Arachnida. General characteristics, features of external and internal structure.

Class Insecta. General characteristics. Variety of insects.

Phylum Chordata. General characteristics, habitats. A variety of Chordatae.

The subphylum Vertebrata. General characteristics. Class Cartilage Fish (Chondrichthyes). Features of the structure, processes of life. A variety of cartilaginous fishes (sharks and tinker).

Class Bone Fish. Features of external and internal structure, processes of life.

Class Amphibia. General characteristics. Features of the structure and processes of life in connection with the exit to land.

Class Reptilia. Features of external and internal structure, processes of life.

Class Birds. Features of external and internal structure, processes of life.

Class Mammalia. General characteristics. Features of external and internal structure. Diversity of mammals.

Human. The position of a human in the organic world.

Human body tissues (epithelial, muscular, nervous, internal tissues: connective, blood, skeletal) their structure and functions.

Musculoskeletal system. Chemical composition, structure, growth and connection of bones.

Muscle tissue. Structure and function of skeletal muscles.

Structure and functions of the blood. The structure and functions of erythrocytes, leukocytes and platelets.

Blood groups. Immunity, types of immunity.

Functions and structure of the circulatory and lymphatic systems. Blood circulation. The structure of the heart.

Blood vessels, their structure and functions. Blood circulation.
Functions and structure of the respiratory organs.
Nutrition and digestion. Structure and functions of the digestive system.
Digestive glands. Vitamins, their properties.
Functions and structure of the kidneys.
Structure and functions of the skin.
Nervous regulation. Reflex. Reflex arc.
Nervous system: central and peripheral. Structure and functions of the spinal cord and brain.

Sensory systems of their significance. Structure and functions of the organs of vision. The structure and functions of the hearing organs. The structure and functions of the equilibrium system.

Higher human nervous activity. Unconditional and conditioned reflexes.

Reproduction of organisms. Forms of reproduction of organisms (asexual, sexual). Methods of asexual type of reproduction of unicellular organisms (division, schizogony, budding, spore formation) and multicellular organisms (vegetative reproduction, spore formation).

Sexual reproduction. Processes of formation of germ cells. Fertility and its forms.

Individual development of organisms. Ontogenesis. Periods of individual development of organisms.

Heredity and variability. Genetics. Methods of genetic research.

Basic concepts of genetics: genes (structural and regulatory), gene allele, gene locus, dominant and recessive states of signs, homozygotes, heterozygotes, genotype, phenotype, gene pool, heredity, variability, pure line.

Patterns of heredity. Patterns of heredity, established by G. Mendel and their statistical nature. Autosomal linkage. Chromosomal theory of heredity. Sex linked inheritance. Interaction of genes and their types.

Patterns of variability. Modification variability.

Hereditary variability and its types: combinative and mutational. Types of mutations. Mutagenic factors.

Selection. Tasks and methods of selection.

Biotechnology, genetic and cellular engineering. Genetically modified and bizarre organisms.

5. SUPRAORGANISMAL LEVELS OF LIFE ORGANIZATION.

Environmental factors: abiotic, biotic, anthropogenic. Population-specific level of organization of life. Kind. Population.

Ecosystems, their composition and diversity. Producers, Consumers, Reducers. Power Chains. Trophy level.

Biosphere. Noosphere. Circulation of substances and energy flows in the biosphere as the necessary conditions for its existence.

6. HISTORICAL DEVELOPMENT OF THE ORGANIC WORLD.

The main ideas of evolutionary doctrine by Charles Darwin.

Synthetic theory of evolution. Microevolution. Natural selection. Species formation. Macroevolution.

**EVALUATION CRITERIA, EVALUATION STRUCTURE, EVALUATION
PROCEDURE
of entrants' answers in the subject "Biology"**

Test point	Characteristics of the applicant's preparedness
0	The entrant does not have any knowledge of the study material. He is unable to identify and name major biological objects.
1	The entrant has educational material at the level of recognition of natural phenomena, with the help of the examiner answers questions that require an answer "yes" or "no".
2	The entrant describes natural phenomena on the basis of his previous experience, with the help of the examiner answers questions that require a one-word answer.
3	With the help of an examiner, the entrant describes the phenomenon or its part in a connected form without explaining the relevant reasons, names the principles of functioning of living organisms.
4	The entrant partially with the help of the examiner describes the phenomena, without explanations gives examples based on his own observations or textbook material, explanations of the examiner and so on.
5	The entrant describes the phenomena, reproduces a significant part of the educational material, and knows the basic properties of living things, basic genetic concepts.
6	The entrant can explain the phenomena with extra assistance, show basic knowledge of genetics and ecology.
7	The entrant can explain the phenomena, correct inaccuracies, show knowledge and understanding of the basic rules (laws, concepts, formulas, theories).
8	The entrant is able to explain phenomena, analyze, summarize knowledge, and systematize them, with the help of an examiner.
9	The entrant is fluent in the studied material in standard situations, gives examples of its practical application and arguments to confirm his/her own opinions.
10	The entrant is fluent in the studied material, skillfully uses scientific terminology, is able to process scientific information (find new facts, phenomena, ideas, use them independently in accordance with the goal, etc.).
11	The entrant has deep knowledge about the object of study, has mastered the program material at a high level, independently, within the current program evaluates various phenomena, facts, theories, uses the acquired knowledge and skills in non-standard situations, deepens the acquired knowledge.
12	The entrant has thorough knowledge within the requirements of the curriculum, shows abilities, is able to independently set the goal of the study, indicates ways to implement it, makes analyzes and conclusions.

Table of points transformation from test points to a scale of 100-200 points

Test point	Points on a scale of 100-200
12	200
11	190
10	180
9	170
8	160
7	150
6	140
5	130
4	125
3	120
2	110
1	100
0	unsatisfactorily

EDUCATIONAL SUBJECT: ENGLISH

The material in the English language program is chosen to meet the goals and objectives that determine the general and professionally oriented levels of the formation of the communicative competence of foreigners and people without citizenship.

In the course of carrying out a task in English, the entrant should orally reveal the content of the given topic, maintaining the logic of the presentation of the material, using the active vocabulary, stylistic and grammatical norms of the English language.

Communicative Competence Content

The applicant should be ready to answer in oral form to one of the following questions:

1. Autobiography.
2. About myself.
3. My family.
4. Description of a person's appearance.
5. My friend.
6. My native country.
7. The weather in my country.
8. The capital city of my country.
9. Interesting places in my country.
10. Excursion around my native city.
11. Holidays in my country.
12. Customs and traditions in my country.
13. My favorite holiday.
14. Gifts. How do I choose gifts?

15. Travelling. Why do people travel?
16. The journey of my dream.
17. What do I know about Ukraine?
18. My hometown.
19. Famous people of my native country.
20. Famous writers of my native country.
21. My school years.
22. Seasons and Weather.
23. Sports. Popular kinds of sports.
24. My favourite sport.
25. My favourite sportsman.
26. The films I like to watch.
27. My favourite actor (actress).
28. The music that I love.
29. My favourite book.
30. The Internet in Modern Life.
31. Television in Modern Life.
32. Professions. My future profession.
33. Why have I chosen Medicine?
34. My plans for the future.
35. My hobby.
36. Free time and leisure activities.
37. My house.
38. The house of my dream.
39. What does it mean "to be happy"?
40. The happiest day of my life.
41. The brightest memories of my childhood.
42. My lifestyle.
43. Socializing with friends.
44. Problems of a modern world.
45. Life in the countryside: advantages and disadvantages.
46. Life in the city: advantages and disadvantages.
47. Ecology and environment.
48. Healthy diet and proper nutrition.
49. Healthy way of life.
50. The most valuable things in my life.
51. The profession of a doctor: advantages and disadvantages.
52. My working day.
53. Eating out.
54. My weekends.
55. The way I celebrate my birthday.
56. The most popular means of transport.
57. My summer holidays.
58. My meals during the day.
59. What cannot be bought with money?

60. We are not doing enough to protect our world.

**EVALUATION CRITERIA, EVALUATION STRUCTURE, EVALUATION
PROCEDURE
of entrants' answers in the subject "English"**

Test point	Characteristics of the applicant's preparedness
0	The entrant does not recognize by ear the most common words in speech that sounds in slowly; does not know how to recognize individual learned words on the basis of the studied material, does not know the most common learned words on the basis of the studied material; does not know the most common learned words and does not adequately use them in speech, makes phonemic errors.
1	Speech is slow; there are four or more long pauses / repetitions / self-corrections; is realized by very limited use of a range of means of interphrase connections with the minimum flexibility.
2	Speech is not free enough; there are three long-term and short-term inaccuracies / repetitions / self-correction; implemented through the partial use of a range of means of interphrase communication with partial flexibility.
3	Speech is mostly free; there are several (2) short pauses / repetitions / self-corrections; is implemented using a wide range of means of interphrase connections with partial flexibility.
4	Speech is free; it sometimes has one short-term uncertainty / repetition / self-correction; is implemented using a full range of means of interphrase connections with sufficient flexibility.
5	Pronunciation and intonation do not correspond to the norms, cause significant difficulties for understanding the listener.
6	The pronunciation sometimes does not meet the norms, but mostly understood; intonation partially corresponds to communicative intentions.
7	The pronunciation is mostly normative, mostly clear; intonation generally corresponds to communicative intentions.
8	Pronunciation is normative, understandable; intonation fully corresponds to communicative intentions.
9	The content minimally reflects the professional situation and topic; very superficially covers ideas; presented with minimal structural organization; provides additional information that minimally specifies and clarifies the main ideas.
10	The content partially reflects the situation and the topic; somewhat superficially reveal ideas; insufficiently structured; provides additional information that partially specifies and clarifies the main information. The content mainly reflects the situation and the topic; mainly covers the declared ideas; generally well structured; provides additional information, which mainly specifies and clarifies the main.
11	The content mainly reflects the situation and the topic; mainly covers the

	declared ideas; generally well structured; provides additional information, which mainly specifies and clarifies the main one.
12	The content fully reflects the professional situation on the topic; fully covers all ideas: well structured; provides additional information that specifies the main ideas.

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