TARAS SHEVCHENKO NATIONAL UNIVERSITY OF KYIV
ESC 'INSTITUTE OF BIOLOGY AND MEDICINE'

INTERVIEW PROGRAM

for entrants on I-course (full-time education)
to gain Master Degree in specialty «Medicine»

Approved by the Academic Council of the
ESC «Institute of Biology and Medicine».
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Introduction

I. Molecular level of life organization
I.1. The elemental chemical composition of organisms. Classification of chemical elements according to their content in the body (macroelements, including organogenic elements, microelements). The consequences of insufficient or excess intake of human body the chemical elements (I, F, Fe, Ca, K) and the ways to eliminate its deficiency. Notion of endemic diseases.

I.2. Inorganic compounds in the body. Role of the water, salts and other inorganic compounds in the body. Hydrophilic compounds. Hydrophobic compounds.


II. The cellular level of life organization


II.3. Metabolism and energy conversion. The exchange of substances (metabolism). Plastic (assimilation) and energy (dissimilation) exchanges. Energy sources for organisms. Autotrophic (phototrophic, hemotrophic) and heterotrophic organisms. The stages of energy conversion in the body: preparatory, anaerobic (oxygen-free) and aerobic (oxygen). Aerobic and anaerobic respiration. The biosynthesis of proteins and its stages. The genetic code and its properties. Codon,


**IV. Organism level of life organization**


**IV.2. Plants.** General characteristics of the plant kingdom. Classification of the plants. Life forms of the plants.

**IV.2.1. The structure of the plant body. The processes of life, reproduction and development of plants.** Peculiarities of unicellular and multicellular plants. The lower and higher plants. The fabrics multicellular plants: generating (meristem) coating (epidermis (skin), cork), basic (storing, pneumatic, asymological), mechanical, leading, their structure and function. Xylem. Phloem. Fiber-twisted bundles.


IV.4.1. Animals structure and livelihoods. Features of organization the single-celled and multicellular animals. Animal webbing. General plan of construction of the animal organism: body symmetry (bilateral, radial); body covering: supporting apparatus (external skeleton, internal skeleton, hydroskeleton); body cavity (primary, secondary, mixed); organs, organs system and their functions. Vulnerability, movement, nutrition, respiration, emission, substances transportation, reproduction, animal growth. Types of animal development: direct and indirect (with complete and incomplete transformation). The regulation of functions in multicellular animals. The features of animal behavior. The concept of reflex and instinctive behavior.

IV.4.2. Animals variety. Single-celled animals. General characteristics. Features of the structure and processes of life (nutrition, respiration, emission, osmoregulation, movement, irritability, reproduction, incineration). Limnetic (amoeba proteus, euglena viridis, paramecium caudatum) and marine (foraminifera, radiolarians) unicellular, their role in nature and human life. The role of marine single-celled species in the formation of sedimentary rocks and as "fossil fuels". The role of unicellular animals in soil formation. Symbiotic single-celled animals: mutualists, comensals, parasites (dysentery amoeba, trypanosomes, malaria plasmodia). Humans diseases and diseases of domestic animals which caused by parasitic unicellular animals. The role of unicellular animals in nature and human life.


Pinnipedia, Cetacea, Artiodactyla, Perissodactyla, Primates; peculiarities of organization, representatives, role in nature and human life. Animal husbandry. Protection of mammals. Lifestyle, especially the external and internal structure, the distribution in nature of representatives of these taxa, their diversity. The value of animals of different taxa in nature and human life.


V.1 Environment of existence. Basic habitats of organisms: ground-air, water, soil. The body of living creatures as a special habitat. Life forms of organisms.


V.4. Biosphere. Biosphere. Noosphere. The living matter of biosphere, its properties and functions. Circulation of substances and energy flows in biosphere as necessary conditions for its existence. Modern environmental problems: growing population of planet, erosion and soil contamination, the growth of large cities, the destruction of forests, the inefficient use of water and energy resources, possible climate changes, negative impact on biodiversity. The Doctrine of V.I. Vernadsky about the biosphere and the noosphere, its importance for avoiding the global ecological crisis.


VI. Historical development of organic world

VI.2. Historical development and diversity of organic world. Modern system of the organic world. Classification principles of organisms. Taxonomic units. The division of the Earth geological history into an era, periods and epochs. The main events that occurred in those or other geological periods of Earth’s history.