

Section 1. Human and his health

Biology as science. Main properties of the live.

Structure, growth and bond of bones. Concept about an osteal tissue. Joint structure. Human skeleton. Departments of the human skeleton. Bones of a skeleton of the head, trunk and extremities. Muscular system. Structure and functions of a smooth and striated muscular tissue. Nervous regulation of work of muscles.

Internal environment: interstitial fluid, lymph, blood, and their composition and value.

Composition of the blood. Vascular system. The structure and work of the heart. The notion of the endocardium, myocardium and epicardium. Heart valves. Cardiac cycle. Automaticity of the heart. Concept of neural and humoral regulation of the heart. Blood circulation circles. Features of the structure of the arteries, capillaries and veins. Large and small blood circulation circles (major blood vessels).

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

Secretory system. Structure and work of kidneys. Nephron structure. Formation of primary and secondary urine. Structure and skin functions. Derivative skins.

Structure and functions of a spinal cord. Neurone structure.

Structure and function of the brain. Structure and function of parts of the brain (medulla, cerebellum, middle, intermediate and forebrain). Cerebral cortex, and its share of the zone.

Structure and functions of an organ of vision. Perception of light and color. Structure and functions of an organ of hearing. Structure and value of an organ of hearing. Mechanism of perception of a sound.

Section 2. Animals

Concept about pro-and eukaryotes. Bacteria, their structure and vital activity. Bacteria parasites. Pathogenic bacteria and ways to combat them.

Characteristic of the unicellular. Features of a structure and vital activity of an Amoeba, Euglena and Infusoria. The parasitic unicellular. Dysenteric Amoeba, Iyambliya, Plasmodium falciparum. Features of a structure and development cycles. Diagnostic and prevention of diseases caused by them.

Features of Flatworms. Features of their structure and functioning. Features of Flukers. Structure and development cycle of liver fluker. Prevention of fascioliasis. Features of Tapeworms.

Structure and development cycle of bovine tapeworm. Prevention of cestodosis.

Features of Roundworms. Features of the structure and functioning of the human Ascaride, development cycle. Prevention of ascariasis.

Characteristic of Arthropods. Features of their structure and vital activity. The class characteristic of Arachnoid on the example of the garden spider. Value of the arachnoid. Class characteristic of Insects. Value of insects.

The characteristic of Chordates. Features of a structure and vital activity of a Lancelet.

Characteristic of a class of Fish. Features of a structure and vital activity of fishes, their value.

Class characteristic of Amphibiouses. Features of a structure, vital activity and development, their value. Class characteristic of Reptiles. Features of a structure, vital activity and development, their value.

Class characteristic of Mammal. Features of a structure, vital activity and development, their value. Concept about marsupials and placental mammals.

Section 3. Fundamentals of Cytology

The cell is the basic structural and functional unit of the living. Mono-and multicellular organisms.. The size and shape of the cells. The main statements of the cell theory. The chemical composition of cells. The concept of macro - and microelements. Water and mineral salts, their role in the cell. Organic substances: proteins, fats, carbohydrates, their structure and functions.

The structure and functions of elementary membranes and cell wall. The main ways of arriving substances in the cell.

Main organoids of a cell (EPS, ribosome, Golgi's complex, mitochondrions, lysosomes, plastids, centrosome), features of their structure and function. Metabolism in the cell. Assimilation and dissimilation as two sides of metabolism. Autotrophic and heterotrophic aerobic and anaerobic cells.

The structure of the cell nucleus and chromosomes. The concept of nuclear wall, nucleoli, nuclear juice and chromatin. Nucleus functions, structure of chromosomes: centromere, shoulders, secondary strangulation, satellite. Types of chromosomes: metacentric, submetacentric, acrocentric. Rules of chromosomes.

Reproduction of cells. Mitosis. Interphase characteristic. Mitosis stages, their characteristic. Change of the contents of genetic information in an interphase and at a mitosis. Value of a mitosis.

Meiosis its characteristic. Concept about a conjugation and a crossingover of chromosomes, their haploid and diploid set. Change of the contents of genetic information.

Section 4. Fundamentals of genetics

Genetics as science. Basic concepts of genetics: gene, genotype, phenotype; allelic, dominant and recessive genes; homo- and heterozygotes; alternative signs. Structure and functions of nucleic acids (DNA and RNA). Gene functions. Protein synthesis in a cell. Concept about a transcription and translation.

Concept about monohybrid crossing. Law of uniformity of hybrids and law of a filial segregation, their cytologic bases.

Dihybrid crossing. Law of independent inheritance of signs, its cytologic basis.

Concept about coupling of genes. Linkage groups. Morgan's experiences. Full and incomplete coupling. Chromosomal theory of heredity.

Genetics of sex. Concept about autosomes and heterochromosomes. Inheritance of sex-linked signs.

Variability and its types. Modification variability, norm of reaction. Genotypical variability: combinative and mutation. Mutagen factors. Gene, chromosomal and genomic mutations.

Fundamentals of Human Genetics. Difficulties of studying of genetics of the person. Research methods: cytogenetic, biochemical, genealogical. Hereditary diseases of the person.