

# PLAN OF LECTURES AND PRACTICAL CLASSES IN BIOLOGY

## Section 1. Cell biology. Medical Protistology

Topic 1. Work with microscope. Microscopy technique

Lecture 1. Introductory

Question 1. History and development of biology.

Ionian, Athenian, Alexandrian and Roman schools of natural Sciences. Renaissance. The main representatives and their works.

Question 2. Properties of living. Cell structure.

Metabolism, self-renewal, irritability, ability to growth, reproduction, adaptation. Anabolic and catabolic processes. Organelles, the main reaction.

Laboratory lesson 1. Work with microscope. Microscopy technique.

Preparation of temporary preparations. Analysis of the main parts of the microscope and their purpose. The study of the rules of work with a microscope and a tripod magnifier. To teach students to work correctly with a microscope, to use permanent and temporary preparations, to make temporary preparations.

A cell is a structural and functional unit of the living. To study plant and animal cells, paying attention to their similarities and differences. To consider and sketch the basic organelles and inclusions cell using drugs and electron diffraction. Pay attention to the structure and function of membranes.

Topic 2. Protozoa Kingdom. Type Sarcomastigophora. Sarcodina Class

Lecture 2. Parasitism as a form of symbiosis.

Question 1. Mechanisms and ways of infection.

Aspiration, fecal-oral, transmissive and contact mechanism of transmission of infectious and parasitic diseases. Ways and factors.

Question 2. Host-parasite interaction. The basic conceptual apparatus (bio, soil-transmitted helminths, antropology, final, intermediate and advanced master). Adaptation of the parasite. Pathogenic effects. The doctrine of natural foci E. N. Pavlovsky.

Question 3. The immunity in helminth infections.

Innate and acquired immunity. Features of its formation in helminthiasis.

Laboratory lesson 2. Protozoa Kingdom. Type Sarcomastigophora. Sarcodina Class

To study the characteristics of the organization of representatives of the Simplest type. Value for medicine. Class Sarkodie. Oral and intestinal dysenteric amoeba. Morphology, traits differences. Ways of infection, pathogenic effect, justification of methods of laboratory diagnosis and prevention.

Topic 3. Protozoa Kingdom. Type Sarcomastigophora. Class Mastigophora

Lecture 2. Parasitism as a form of symbiosis.

Question 1. A systematic survey of the protists and multicellular animals, of medical importance.

Morphological characteristic. Life cycles and ways of transmission of parasitic representative Sarkodovyh, Flagellates, Sporozoans and Ciliates. Harm to health, prevention of infection, diagnosis.

Question 2. Characteristics of the types of subculture Multicellular, representatives of which lead a parasitic existence. Morphological characteristic. Distinctive feature. Life cycles and ways of infection of parasitic representatives of Flukes. Clinical picture. Harm to health, prevention of infection, diagnosis. (Lecture, using multimedia).

Laboratory lesson 3. Protozoa Kingdom. Type Sarcomastigophora. Class Mastigophora.

Leishmania – causative agents of cutaneous and visceral leishmaniasis. Trichomonas-vaginal and intestinal, Giardia, trypanosomes. Morphology, features of differences, ways of infection, pathogenic effect, justification of methods of laboratory diagnostics.

Topic 4. Type of Apicomplexa. Class Sporozoa. Type of Ciliophora

Laboratory lesson 4. Type of Apicomplexa. Class Sporozoa. Type Ciliophora.

The Class Sporozoa. Toxoplasm. The types of malaria parasites that are pathogenic for humans. Infusion Class. Balantidia. Morphofunctional characteristics, development cycles, pathways of infection, pathogenic effect, substantiation of methods of laboratory diagnosis and prevention.

Topic 5. Colloquium on "Cytology. Medical Protistology".

Laboratory lesson 5. Colloquium on "Cytology. Medical Protistology". Analysis of life cycles and peculiarities of penetration into the human body. Disease prevention. Analysis of situational tasks and case studies.

## **Section 2. Medical parasitology**

Theme 6 type Flat worms. Class Flukes 1.

Lecture 3. Systematic review of multicellular animals of medical importance.

Question 1. Characteristics of the types of subculture Multicellular, representatives of which lead a parasitic existence. Their morphological characteristics. Distinctive feature.

Question 2. Life cycles and ways of infection of parasitic representatives of Tapeworms and roundworms. Clinical picture. Harm to health, prevention of infection, diagnosis. (Lecture, using multimedia).

Laboratory lesson 6. A type of flatworm. Class Flukes 1.

The concept of helminths. Soil-transmitted helminths and bioelement. A type of flatworm. Characteristic features of the organization. Medical significance. Class suckers. Liver and lung flukes, Schistosoma. Morphology, cycles of development, distribution, ways of infection, pathogenic effect, justification of methods of laboratory diagnosis and prevention.

Topic 7. A type of flatworm. Class 2 Suckers.

Laboratory lesson 7. A type of flatworm. Class 2 Suckers.

Siberian, Chinese, and Lancet flukes. Morphology, cycles of development, distribution, ways of infection, pathogenic effect, justification of methods of laboratory diagnosis and prevention.

Topic 8. A type of flatworm. Class I Tape worms

Laboratory lesson 8. A type of flatworm. Class I Tape worms

Characteristic features of the organization. Bull, pork tapestry. Morphology, cycles of development, distribution, ways of infection, pathogenic effect, justification of methods of laboratory diagnosis and prevention.

Topic 9. A type of flatworm. Class Tapeworms II.

Laboratory lesson 9. A type of flatworm. Class Tapeworms II.

Wide band, Echinococcus, alveococcus, dwarf tapeworm. Morphology, cycles of development, distribution, ways of infection, pathogenic effect, justification of methods of laboratory diagnosis and prevention.

Topic 10. A type of Round worms. Nematode Class 1.

Laboratory lesson 10. A type of Round worms. Nematode Class 1.

Characteristic features of the organization and medical value. Ascaris, whipworm, ancylostomidae. Morphology, cycles of development, distribution, ways of infection, pathogenic effect, justification of methods of laboratory diagnosis and prevention.

Topic 11. A type of Round worms. Nematode Class 2.

Laboratory lesson 11. A type of Round worms. Nematode Class 2.

Pinworm, Trichinella, Guinea-worm, filaria. Morphology, development cycles, distribution, pathogenic effect, substantiation of laboratory diagnostics and prevention methods.

Topic 12. Helminthologia.

Laboratory lesson 12. Helminthologia.

The main methods of diagnosis of parasitic diseases. Differential diagnosis. Anamnesis, examination, collection of material for the study. Learn to distinguish the eggs of the main types of parasitic worms. Know the basic methods of coprological analysis.

Topic 13. Colloquium on "Medical Parasitology".

Laboratory lesson 13. Colloquium on "Medical Parasitology".

The main mechanisms and ways of infection with parasitic diseases. Epidemiological danger of patients. Prevention method. Solution of situational problems.

Topic 14. Type Arthropods. The Class Arachnida. The Detachment of Ticks.

Laboratory lesson 14. Type Arthropods. The Class Arachnida. The Detachment of Ticks.

Medical value (carriers, natural reservoir, pathogens). Ticks (dog, taiga, dermacentor), agatovye ticks (a tick village). Itch mite. Acne iron. Structure, development cycles, control measures.

Theme 15 Class Insects. A squad of lice, fleas, Diptera.

Laboratory lesson 15. The Insect Class. Detachment of lice, fleas, Diptera

Detachment of lice and fleas. The most important representatives. Medical significance. Structure, development cycles, control measures. Two-Winged Unit. Medical value (vectors of vector-borne diseases, causes of diseases). Mosquitoes, mosquitoes, flies. Structure, development cycles, control measures.

Topic 16. Colloquium on "the Medical significance of arthropods"

Laboratory lesson 16. Colloquium on "the Medical significance of arthropods". The role of arthropods in the emergence and transmission of diseases. Solution of situational problems. Verification of independent extracurricular activities. Summing up on the development of the material of the first semester.

Section 3. Developmental biology, homeostasis, regeneration

Topic 17. Cell life and mitotic cycles

Lecture 4. Reproduction of organisms as a mechanism to ensure the change of generations.

Question 1. Question 1. Methods of reproduction.

Characteristics of asexual and sexual reproduction. Biological meaning of asexual and sexual reproduction. Their evolutionary significance. The importance of asexual reproduction for multicellular organisms.

Question 2. Periodization of ontogenesis. Obstetric-embryological and pediatric approaches in the periodization of ontogenesis.

Practical lesson 17. Cell life and mitotic cycles.

Mitosis. To study the main forms of mitosis and periods of the cell cycle. Consider and sketch the phases of mitosis and the structure of polytene chromosomes. Sketch a submicroscopic diagram of the structure of human chromosomes.

Topic 18. Reproduction. Meiosis. Gametogenesis.

Lecture 5. Gametogenesis as the process of formation of germ cells.

Question 1. Meiosis as a process of formation of haploid gametes. Phases of meiosis, their characteristics and significance. Recombination of hereditary material.

Question 2. Oogenesis. Spermatogenesis. The formation of eggs and sperm. Their structure. Fertilization.

Laboratory lesson 18. Reproduction. Meiosis. Gametogenesis.

To study the main types of asexual and sexual reproduction. Meiosis and gametogenesis. View and sketch the structure of the egg and sperm of vertebrates. Features of their structure, determining the purpose.

Topic 19. Ontogenesis. General patterns of embryonic development

Laboratory lesson 19. Ontogenesis. General patterns of embryonic development.