Questions of the "Microbiology, Virology, Immunology" exam
Chapter 1 - General Bacteriology and Virology

2. Simple and complex staining techniques. Microscopy of the native and stained preparations.
4. The morphology, structure and chemical composition of bacteria.
5. The capsule of bacteria, chemical composition, the value and methods of capsule detection.
12. Classification of bacteria respiration types. The essence of the breathing process. Methods of anaerobic bacteria cultivation.
16. Isolation of aerobic bacteria pure culture.
17. Isolation of anaerobic bacteria pure culture.
18. The morphology, structure and chemical composition of the viruses.
19. The mechanism of viruses interaction with sensitive cell. The main phase of the virus interaction with host cells.
23. The action of the physical, chemical and biological agents on the microbes. Synergism, and antagonism of microorganisms. The practical use.
26. Antibiotics, classification (by origin and chemical structure). Units of the antimicrobial activity.
27. The using of microorganism in biotechnology. Microorganisms are producers of immune biological preparations.
28. The using of microorganisms for the production of aminoacids, vitamins, hormones, antibiotics.
29. Biological mechanisms of antibiotics action on microbial cell. Natural and acquired resistance to antibiotics.
30. Methods for determining the sensitivity of microorganisms to antibiotics. The concept of the bactericidal and bacteriostatic effect, their determination.
32. Mutations and their varieties. Physical, chemical and biological mutagens.
33. Modification, their mechanisms and forms of manifestation in bacteria.
34. Bacteria drug resistance, genetic mechanisms. Primary and acquired resistance. R-plasmid.
35. The role of antibiotic-resistant bacteria in clinical practice. Causes of antibiotic resistance formation. Ways to overcome it.
36. Genetic recombination: transformation, transduction, conjugation. Plasmids (F-, R-, Col-, Ent-).
37. Practical using of genetic engineering in medical microbiology, virology, immunology and biotechnology.
38. Bacteriophages, general characteristics. The virulent and temperate phages in medicine and microbiology.
39. The using of bacteriophages in microbiology and medicine.
40. Morphology and structure of medically important protozoa. The life cycles of its development.
Section 2 - Infection and Immunity

1. The microflora of the human body, its role in normal physiological processes and disease.
2. The value of normal microflora as a factor of the first line of immune system.
3. Dysbacteriosis, Types of eubiotics. Practical use in medicine and dentistry.
5. Pathogenicity and virulence of microbes. Indexes of virulence: LD 50, DLM.
6. Microbial pathogenic factors and their detection.
8. The role of microorganism, environmental and social conditions in the development of infectious diseases.
9. The main periods of infectious disease. The carrier of the pathogen.
10. Manifestations of infection: acute, chronic, latent, persistent, relapse, reinfection, superinfection.
11. Immunity, definition, types and forms of its manifestation.
12. The specific and non-specific immunity, general characteristics.
13. The immune system of the body. Organs, cells, surface markers and receptors in these cells.
15. The cell and tissue protection mechanisms. The protective function of the skin, mucous membranes, lymph nodes. Inflammation.
16. Phagocytosis, its role in protecting against infectious diseases. The complete and incomplete phagocytosis. The causes of incomplete phagocytosis.
17. Humoral nonspecific protective factors: complement, beta-lysine, properdin and others.
23. Cytokines, concepts, basic properties. Interferons, basic properties, mechanism of interferon formation. The use of interferon drugs in medical practice.
25. The essence of transplantation immunity and ways to overcome it. Immunosuppressants.
26. Antitumor immunity, its features.
27. Antitoxin, and application antitoxic sera in medicine.
33. Serological tests for viral diseases (neutralization, complement fixation).
34. Immediate and delayed hypersensitivity types, their differences. Practical use of tests in the diagnosis of allergic infectious diseases.
35. Vaccines, its types. The methods of administration. Side effects of vaccine preparations.
36. Live vaccines, the principles of preparation. Practical use and evaluation of result.
38. Chemical vaccine principles of preparation. Practical use and evaluation of result.
39. Toxoid, their preparation and use.
Section 3 - Special Bacteriology

Section 4- Special virology and clinical microbiology.


14. Pathogens of A viral hepatitis: general characteristics. Pathogenesis, immunity, laboratory diagnosis, prevention of diseases. Describe the immune (gamma) globulin (IG) against hepatitis A.


17. Retroviruses, general characteristics. Human Immunodeficiency Virus. Pathogenesis, laboratory diagnostics, prevention of AIDS. Criteria for interpretation of immunoblot result for HIV.


22. TVV and SEN hepatitis viruses: biological characteristics, epidemiology, pathogenesis, principles of diagnostics and prevention.


32. Rabdoviridae, general characteristics. Rabies virus, difference of the fixed and wild strains. Pathogenesis, immunity, laboratory diagnosis, prevention of the rabies. Describe the human diploid cell vaccine (HDCVs).


34. Viruses of Ebolavirus genus Filoviridae genera – pathogens, which controlled by International Health Regulations: epidemiology, diagnostics and prevention.

35. Marburg virus (MARV) and Ravn virus (RAVV) Filoviridae genera – pathogens, which controlled by International Health Regulations: epidemiology, diagnostics and prevention.


38. Oncogenic viruses, general characteristics. Viral-genetic theory of the oncogenesis. The role of viruses in the etiology of leukemia and tumor formation.


40. Parvoviridae. Biological characteristics. Laboratory diagnostics.


44. Opportunistic iatrogenic infections. Hospital strain. Hospital ecotype resistant to antibiotics, antiseptics. The role of medical interference and immunodeficiency. Superinfection by hospital ecotype.