

УТВЕРЖДАЮ
заведующий кафедрой
микробиологии
ФГБОУ ВО ВолГМУ Минздрава России



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Exam questions on “Microbiology, virology – of the oral cavity” discipline for students of 2023, 2024 years of enrollment under the educational program 31.05.03. Dentistry (specialty program), full-time training, for 2024-2025 academic year

general course

1. Taxonomy and classification of bacteria. Give the definition of the main taxonomical categories.
2. Infection and infectious diseases. Principles of classification of infections. Give examples of each type of infection.
3. Bacterial ultrastructure. Study of morphology of bacteria.
4. Pathogenicity and virulence. Discuss the groups of pathogenic factors of bacteria and give the examples of each one.
5. Exotoxins and endotoxins. The main properties.
6. The main methods of microscopy in microbiology. Describe the principle and practical application of each type of microscopy.
7. Biological method of investigation (animal models).
8. Classification of staining techniques: simple and complex methods. Principle, stages and practical application of each method.
9. Microbial flora of soil. Sanitary-significant microorganisms of soil. Coli – titre, coli – index and microbial number in soil.
10. Microbial flora of water. Sanitary – significant microorganisms of water. Methods to determine coli – titre, coli – index and microbial number.
11. Microbial flora of air. Sanitary – significant microorganisms of air. Microbial number in the air, methods of its determination (Koch`s and Croton`s methods).
12. Nutrition of microorganisms. Classification of bacteria on the basis of their nutritional requirements. Essential nutrients for the growth and multiplication of microorganisms.
13. The main types of respiration of microorganisms. Methods of cultivating aerobes and anaerobes.
14. Pathogenicity and virulence of microorganisms. DL_{min}, DCL, DL₅₀.
15. Classification of culture media, their composition and practical application. Basic requirement of culture media.
16. Phagocytosis. Types of phagocytic cells. Stages of phagocytosis. Completed and incompleting phagocytosis.
17. Principles of isolation and identification of microorganisms (aerobes and anaerobes).
18. Microbial growth and multiplication, distinct phases of bacterial growth.
19. Principles of biochemical tests for identification of bacteria. Biochemical properties of microorganisms.
20. Antibiotics. Classification on the basis of their mechanisms of action and antibacterial spectrum.
21. Antibiotics. Methods for obtaining and characterization of chemical groups.
22. Main properties of the substance that is considered to be an “antigen”. Complete antigens and haptens. Bacterial and virus antigens.
23. Mechanisms of resistance to antimicrobial agents.
24. Antibiotic sensitivity tests.
25. Sterilization. Physical methods.
26. Desinfection - chemical agents.

27. Ingredients and mechanism of agglutination reaction. Slide agglutination, tube agglutination, indirect or passive agglutination tests. Practical significance.
28. Methods of isolating a pure culture of microorganisms.
29. Ingredients and mechanism of precipitation reaction. Types of precipitation tests. Practical significance.
30. Bacteriological investigation: stages, practical significance.
31. Complement fixation test. Ingredients. Mechanism, practical significance.
32. Normal microflora of human body. Obligate and facultative flora. Significance of normal microbial flora.
33. Normal microbial flora of the intestinal tract, its formation and significance.
34. Normal microbial flora of the respiratory tract. Obligate and facultative flora of each area.
35. Normal microbial flora of skin, eye and ear. Obligate and facultative flora of each area.
36. Vaccines. Classification of vaccines. Examples of each type of vaccines.
37. Normal microbial flora of genitourinary system, its significance.
38. Live vaccines. Examples. Advantages and disadvantages of live vaccines. Practical significance.
39. Dysbios. Conditions inducing dysbios. Stages of dysbios.
40. Killed vaccines. Examples. Advantages and Disadvantages of killed vaccines. Practical significance.
41. Morphology and principles of classification of viruses. The main properties of viruses.
42. Toxoids (anatoxins), their receivment. Practical significance.
43. Physiology of viruses. Methods of cultivation and detection of viruses.
44. Specific immune sera, their types. Receivment and practical significance.
45. Viral multiplication. Steps of viral biosynthesis of different DNA and RNA containing viruses.
46. Detection of virus presence in the clinical specimen (cytopathic effect, plague assay, metabolic inhibition, hemagglutination and hemadsorption).
47. Microscopical methods of investigation. Principles and practical application of each type of microscopy.
48. Innate and acquired immunity.
49. Genetic organization of bacteria. Plasmids.
50. Methods of transmitting genetic information and types of recombination in microorganisms

private course

1. Staphylococci. Classification. Biological properties. Factors of pathogenicity. Methods of diagnosis. Treatment and prevention.
2. Streptococci. Biological properties. Which clinical syndromes can staphylococci induce? Diagnosis of staphylococcal infections.
3. Neisseria meningitidis. Biological properties. Epidemiology, clinical syndromes of meningococcal infection. Laboratory diagnostics. Treatment, prophylaxis.
4. Neisseria gonorrhoeae. Biological properties. Epidemiology, pathogenesis and clinical syndromes of gonococcal infection. Laboratory diagnostics. Treatment and prophylaxis.
5. Clostridium perfringens. Biological properties. Epidemiology, clinical syndromes, laboratory diagnostics. Treatment, prophylaxis.
6. Clostridium tetani. Biological properties. Epidemiology, pathogenesis, clinical syndroms of tetanus. Laboratory diagnostics. Treatment, prophylaxis.
7. Clostridium botulinum. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.
8. Causative agents of enteric fever. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.
9. Causative agents of salmonella enteritis (salmonellosis). Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.
10. Causative agents of bacterial dysentery. Classification. Biological properties. Laboratory diagnosis. Treatment, prophylaxis.

11. Biological properties of *E. coli*. Classification of enteropathogenic *E. coli*. . Laboratory diagnosis. Treatment, prophylaxis.
12. Causative agent of plague. Biological properties. Epidemiology, clinical syndromes, laboratory diagnostics. Treatment, prophylaxis.
13. Causative agents of cholera. Biological properties. Epidemiology, pathogenesis, clinical syndromes of cholera. Laboratory diagnostics. Treatment, prophylaxis.
14. Causative agent of diphtheria. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.
15. Causative agent of whooping cough. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.
16. Causative agent of tuberculosis. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Allergic tests. Treatment, prophylaxis.
17. Leprosy. Biological properties of *M. leprae*. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.
18. Causative agent of anthrax. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.
19. Causative agent of brucellosis. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.
20. Causative agent of tularemia. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.
21. Causative agent of leptospirosis. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.
22. Causative agent of syphilis. Biological properties. Epidemiology, clinical syndromes. Laboratory diagnostics.
23. Causative agent of relapsing fever. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.
24. Hospital infections. Characteristics of causative agents. Laboratory diagnostics
25. Causative agents of slow viral infections. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.
26. Causative agent of smallpox. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.
27. Adenoviruses. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.
28. Hepatitis B viruses. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.
29. Hepatitis C viruses. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.
30. Hepatitis D viruses. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.
31. Hepatitis A and E viruses. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics.
32. Causative agent of rabies. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics.
33. Influenza viruses. Biological properties. Epidemiology, clinical syndromes, laboratory diagnostics. Treatment, prophylaxis.
34. Parainfluenza viruses. Biological properties. Epidemiology, clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.
35. Picornaviruses. Causative agent of poliomyelitis. Biological properties. Epidemiology, clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.
36. ECHO viruses. Biological properties. Epidemiology, clinical syndromes, laboratory diagnostics. Treatment, prophylaxis.
37. Coxsackieviruses. Biological properties. Epidemiology, clinical syndromes, laboratory diagnostics. Treatment, prophylaxis.
38. Enteroviruses. Biological properties, pathogenesis of enteroviral infections, laboratory diagnostics.

39. Measles virus. Biological properties. Epidemiology, clinical syndromes, laboratory diagnostics. Treatment, prophylaxis.
40. Herpesviruses: Varicella-zoster virus. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis
41. Herpesviruses: Cytomegalovirus. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis
42. Herpesviruses: Herpes simplex viruses. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis
43. Herpesviruses: Varicella-zoster virus. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis
44. Herpesviruses: Epstein-Barr virus. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis
45. Mumps virus. Biological properties. Epidemiology, clinical syndromes, laboratory diagnostics. Treatment, prophylaxis.
46. Respiratory syncytial virus. Biological properties. Epidemiology, clinical syndromes, laboratory diagnostics. Treatment, prophylaxis.
47. Rickettsias. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.
48. Chlamydia. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.
49. Mycoplasma: Cytomegalovirus. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.
50. Fungi and Actinomyces. Biological properties. Epidemiology, pathogenesis and clinical syndromes. Laboratory diagnostics. Treatment, prophylaxis.