

## **Step – II courses**

### **General Bacteriology**

**1. For experiment, carbohydrate media were sterilized in laboratory conditions with flowing steam in one day for 30 minutes: in the morning, at noon and in the evening. In what manner did media sterilization have to be performed?**

To be sterilized within 15 minutes.

To be sterilized within 45 minutes.

+To be sterilized three days with 24 hours interval.

To be sterilized within 1 hour.

To be sterilized twice a day.

**2. When determining the type of etiologic agent, released from the patient's body with the suspicion of cholera, one of the agents identified is its monotrichous vagility assessment. Which research method should be used in this concern?**

Loeffler's staining method.

Stab-inoculation in gelatine method.

+ "Hanging" or "crushed" drop method.

Stab-inoculation in agar method.

Plating method in peptone water.

**3. After finishing their work, the students should arrange their working place, disinfect the table and instruments. Which chemical substances should be used for this purpose?**

Hydrochloric acid.

Formaline.

Chloroform.

Ether.

+Chloramine.

**4. Bacteria mutations happen as the result of:**

Structural enzymes.

Nutritional medium high reductive-oxidative potential.

+Basic nitrogens.

Recombinant vaccine.

Adaptive enzymes.

**5. The process when DNA, released by one bacterium lysis, penetrates to another bacterium which leads to its phenotype mutation, is called:**

Sexduction.

+Transformation.

Transduction.

Conjugation.

Transfection.

**6. R – plasmids encode the synthesis of:**

Sexual villi to transmit genetical information.

Enzyme, destroying erythrocytes membranes.

Enterotoxin.

+Enzymes, calling therapeutic preparations inactivation and cytoderm permeability for antibiotics.

Proteins, causing bacteria of the same specie death.

**7. The laboratory investigated tetanus diagnostic methods. Which sterilization method is suitable for the released culture extermination?**

+Autoclaving.

Boiling.

Tyndalization.

Hot air over.

Pasteurization.

**8. In Gram staining method, processing with ethyl alcohol is utilized for the purpose of:**

+Bacteria differentiation.

Fixing the preparation.

Preparation dessication.

Bacteria extermination.

Excessively colored preparation decoloration.

**9. For bacteria conjugation it is necessary the presence of:**

+F-plasmid.  
Prophage.  
R-plasmid.  
Col-plasmid.  
tox<sup>+</sup>-gene.

**10. The following outstanding microbiologist and epidemiologist used to be the President of Ukrainian Academy of Sciences:**

L.C. Tsenkovsky.  
M.F. Gamaleya.  
I.I. Mechnikoff.  
V.V. Podvysotsky.  
+D.K. Zabolontny.

**11. Which nutrient medium is more suitable for primary bacterial inoculation to separate pure growth from microbial mixture?**

Universal.  
+Differential-diagnostic.  
Special.  
Elective.  
Enrichment media.

**12. Antibiotics are utilized for:**

Specific etiologic therapy.  
Pathogenetic therapy.  
Symptomatic therapy.  
+Non-specific etiologic therapy.  
Specific prophylaxis.

**13. In antibioticogram, obtained from bacteriologic laboratory, the information about bacteria sensitivity and resistance is given on antibiotics action, indicating diameters of bacteria growth delay. Which method used by the bacteriologist to detect microorganisms sensitivity to antibiotics?**

Serial cultivation method on dense nutrient medium.  
+Disk-diffusion method (diffusion in agar method, using standard disks).  
Method, based on indicator color alteration in the event of medium pH change.  
Serial cultivation method in liquid & nutrient media.  
Method, based on microorganisms enzymatic activity alteration.

**14. To perform surgical operation, you need to sterilize dressing (fascia, tissues, bulky turuntules). Choose the best surgical material sterilization method.**

+Steam under pressure.  
Tyndalization.  
Hot air oven.  
Pasteurization.  
Boiling.

**15. In course of patients' therapy with antibiotics, bacteria often become resistant to antibiotics influence. Bacteria resistance does not develop in case:**

+Cytoplasm permeability is changed.  
Antibiotic interacts with the target and depresses its function.  
Non-specific targets are blocked.  
Hydrolase-type enzymes emerge.  
Target structure is changed.

**16. At microscopic preparation, prepared from the researched material of a sick child with the suspicion of diphtheria, and stained according to Neisser, it was found light-brown bacilli with dark-blue thickenings on ends. Which structural element of microbial cell was found by the microbiologist?**

Nucleoid.  
Capsule.  
Spore.  
Flagella.  
+Volutine granules.

**17. For microbiological research, planned for the next day, sterile Petri dishes, pipettes are needed. Which sterilization method of sterilization should be utilized for bacteriological dishware?**

+Sterilization with dry heat.  
Tyndalization.

Pasteurization.

Boiling.

Sterilization with flowing steam (fractional sterilization).

**18. When investigating the infective episode in hospital, different strain staphylococcus was isolated from nasopharynx of a nurse, from strain isolated in the patient with R-plasmid. Which sign may staphylococcus hospital strain obtain at bacteria conjugation?**

Ability to synthesize staphylocines.

To form rough colonies.

Fertility.

+Resistivity to antibiotics.

Ability to synthesize enterotoxin.

**19. When staining the preparation from sputum of the patient with the suspicion of pneumonia, the bacteriologist had utilized the following colors and reagents: gentian violet solution, Lugol's solution, 96° ethanol, Pfeiffer's fuchsin. Which method was used by the microbiologist for this preparation?**

+Gram staining method.

Romanowsky-Gimza staining method.

Ziehl-Neelsen staining method.

Neisser staining method.

Löffler staining method.

**20. Penicillin is an antibiotic with bactericidal action, nevertheless it does not have toxic action on human body. This is stipulated by:**

+Absence of peptidoglycan in human envelop.

Absence of mesosomes in human cells.

Absence of 70S ribosomes in human cells.

Peculiarities of mitochondria structure in human cells.

Peculiarities of cytoplasmic membranes structure in human cells.

**21. For air disinfection in aseptic box, a range of generally recognized sterilization methods have been undertaken. Which sterilization method is the most adequate for air disinfection after work in aseptic box?**

+Ultraviolet irradiation (quartz).

Calcination.

Sterilizing with benzoic acid fumes.

Sterilizing with alcohol fumes.

Sterilizing with magnetic field action.

**22. At microbiology lesson the students had studied microscopy diagnostic method. Which bacteria features had the students studied with the help of this method?**

+Morphological, tinctorial.

Cultural.

Antigenous.

Toxigenous.

Biochemical.

**23. In the event of microbiological diagnostics of a number of infectious diseases Gram's staining method is used. Which bacterial cell structures are responsible for the bacterial ability to accept colors?**

+Cell wall.

Cytoplasmic membrane.

Mesosoma.

Capsule.

Plasmids.

**24. In the event of microbiological diagnostics of a number of infectious diseases, bacterial method is utilized. What is the objective of I<sup>st</sup> stage of bacteriological investigation?**

+Isolated colonies separation.

The research material inoculation.

Microscopy of research material.

Separation and accumulation of pure culture.

Identification of research culture.

**25. The phenomenon, when prophage may be replicated together with bacterium nucleoid without causing bacteria death is called:**

+Lysogeny.

Transfection.

Transformation.

Modification.

Transduction.

**26. Bacterial cells resistance to antibiotics is stipulated by the presence of genetic structure in their cell, where by transmission occurs during conjugation. How is the autonomous genetic structure of bacterial cell called?**

+R-plasmid.

Ent-plasmid.

Col-plasmid.

Transposons.

Prions.

**27. It is known that bacterial cells contain additional genetic structures that may be separated from bacterial nucleoid as independent elements or be integrated with the nucleoid. Additional genetic structures allow for the additional features of those bacteria. What is the name of those additional genetic structures?**

+Plasmids.

Prophage.

Nucleotides.

Is-sequences.

Wondering genes.

**28. From the patient's faeces with enteric infectious disease the bacteriologist had separated pure culture of vibrios. To which bacterial group will you relate those microorganisms due to their morphological signs?**

+Spiral bacteria.

Clostridia.

Cocci.

Bacteria.

Bacilli.

**29. At dark field microscope of material from a patient with chancre [vaginal mucous membrane], there were spirochete. To which bacterial group will you relate those microorganisms as per their morphologic peculiarities?**

+Spiral bacteria.

Clostridia.

Cocci.

Bacteria.

Bacilli.

**30. From purulent content of a wound, located on a patient's neck, the bacteriologist had made the preparation, where ray actinomycetes were found. To which bacterial group should those microorganisms be related due to their morphologic peculiarities?**

+Branching form.

Clostridia.

Cocci.

Bacteria.

Spiral bacteria.

**31. DNA-polymerase of *Thermus aquaticus* is the important component of polymerase chain reaction (PCR). *Thermus aquaticus* is the microorganism, able to grow at 100 °C and higher temperature, is a:**

+Thermophile.

Mesophile.

Psychrophile.

Halophile.

Chemolitotroph.

**32. In term of bacterial culture microscopy there were found microorganisms, possessing the form of spindle, they were stained by Gram's method in blue-violet color. What are these microorganisms called?**

+Clostridia.

Streptococci.

Spirochete.

Actinomycetes.

Diplococci.

**33. In preparation, stained by Ojeshko's method, the bacteriologist had found microorganisms of rod-like form, that were colored blue, and terminally arranged structures of orbicular form were colored red. What is the name of this structure?**

+Spore.

Flagella.

Fimbriae.

Capsule.

Mesosoma.

**34. In biotechnological processes when preparing therapeutic preventive preparations, the procedure of human genes introduction into bacterium genome with the help of bacteriophage was used. What is the name of this process?**

+Transduction.

Transformation.

Translation.

Conjugation.

Deletion.

**35. To obtain genetically engineered insulin, there is separated Escherichia coli strain, holding gene, determining those hormone synthesis. The important phase in creating and producing strain was utilization of vector, causing E. coli cell degradation after its function execution. Which genetic structure stipulates E. coli cell degradation?**

+Bacteriophage.

Plasmid.

Isolated RNA fragment.

Isolated DNA fragment.

Transposons.

**36. Pathogenic bacteria in host organism are able to be fixed on cells surface. Which bacterial cells structures stipulate causative agent adhesion?**

+Fimbriae.

Capsule.

Flagella.

Mesosoma.

Volutine granules.

**37. In patient's material there was separated bacterial pure culture. With the help of which nutritious medium should the bacteriologist make identification of causative agent due to enzymatic properties?**

+Hiss media.

MPA with bile (Ploskirev's media).

Endo agar.

EMB agar.

Wilson-Blair's agar.

**38. When inoculating patient's faeces after typhoid fever, the bacteriologist separated the colonies on Endo medium, possessing various colors and dimensions. Some colonies were big and had red color, the other were colorless and of average sizes. What kind of medium (as per its assignment) is the Endo agar?**

+Differential diagnostic.

Selective.

Special.

Enriched.

Enrichment medium.

**39. During microorganisms growth in peptone water, the indicator paper, wetted with oxalic acid, was colored red, wetted with lead acetate paper – black, litmus paper – blue. What enzymes are indicated by this method?**

+Proteolytic of tripsin type.

Proteolytic of pepsin type.

Saccharolytic.

Oxidoreduction.

Lipolytic.

**40. At microbiology practical studies, the students were asked to apply Gram's staining method to bacteria mixture and to explain staining mechanism. What morphologic structure of a bacterium and peculiarity of its constitution stipulate positive or negative bacteria staining as per Gram's method?**

+Cell wall.

Cytoplasmic membrane.

Nucleoid.

Capsule.

Cytoplasmic inclusions.

**41. In case of therapy with antibiotics, there is often observed the transition of L-form microorganisms, which are characteristic of:**

+Bacteria without cell wall.

Among mycoplasmas only.

May not reverse to initial form.

Look more like viruses than like bacteria.

The most virulent fungi forms.

**42. Diagnosis of diseases caused by coli bacillus group, include the study of capability of the separated pure culture to ferment carbohydrates. Which media are utilized by bacteriologists for this purpose?**

+Hiss media.

Glycerine and potato agar.

Endo agar.

Sabouraud's medium.

MPA.

**43. For post-operative complications prevention, 50ml of liquid polyvalent staphylococcal bacteriophage were introduced in patient's abdominal cavity. What is the preparations mechanism of action?**

+Causes microbial cells lysis.

Causes staphylococcal toxins neutralization.

Causes immunity activation.

Causes causative agent growth inhibition.

Causes pathogenicity enzymes biosynthesis deterioration.

**44. In micropreparation from the patient's sputum ill with croupous pneumonia there were found microorganisms surrounded by capsule. What is the chemical composition of the exposed structures?**

+Polysaccharides.

RNA.

Peptidoglycan.

Lipids.

DNA.

**45. After incubation in anaerostate of the necrotizing tissue homogenate inoculation on Zeissler's blood agar, after 48 hours, big flat R-type colonies grew, with tendency of scrawling growth. Which characteristics of the separated microbes are indicated in test assignment conditions?**

+Cultural.

Morphological.

Tinctorial.

Proteolytic.

Hemolytic.

**46. When staining the preparation of patient's phlegm, the bacteriologist applied following colorants and reagents: Ziehl's fuchsine solution, methylene blue solution, 5% solution of sulphuric acid. Which staining method was utilized by the bacteriologist?**

+Ziehl-Neelsen's.

Burri-Gins'.

Gram's.

Peshkov's.

Neisser's.

**47. In laboratory for extremely dangerous infections, microbiological investigation of pathological material from the patient with diagnosis "plague?", was stained as per Burri-Gins' method. Which causative agent's property enables to stipulate the given staining method?**

+Capsules forming.

Spore forming.

Acid resistance.

Alkaline resistance.

Volutine granules availability.

**48. Material from the patient's wound with suspicion of gas anaerobic infection was inoculated to the preliminary heated boiling Kitt-Tarozzi medium. With what purpose was the medium preliminary heated?**

+To remove oxygen from medium.

To abolish microorganisms.

To dissolve salts.

To sterilize medium.

To enrich medium with oxygen.

**49. A patient in infectious department was diagnosed with "diphtheria". In material from the patient's tonsils the bacteriologist found blue bacilli with volutine corns on poles. What staining method was utilized by the bacteriologist?**

- +Loeffler's method.
- Burri-Gins' method.
- Gram's method.
- Ziehl-Neelsen's method.
- Zdrodovsky's method.

**50. All bacteria due to their respiration type are divided to obligate aerobes, microaerophiles, facultative anaerobes and obligate anaerobes. Which organisms are microaerophiles?**

- +Leptospira.
- Rickettsia.
- Chlamydia.
- Mycobacteria.
- Clostridia.

**51. There exists the complicated method of acid resistant bacteria staining, when bacteria under influence of general colorant obtain bright red color. Name the given staining method.**

- +Ziehl-Neelsen's method.
- Gram's method.
- Morozov's method.
- Zdrodovsky's method.
- Loeffler's method.

**52. Under unfavorable environmental conditions, microorganisms form special structures to preserve their species. To disclose those structures Ojeshko method is used. This staining method is used to determine which structural cell components?**

- +Spore.
- Capsule.
- Flagella.
- Volutine granules.
- Membrane.

**53. These separated coli bacillus strain had the ability to synthesize bacteriocines. What stimulates this ability?**

- +Plasmids.
- Mutations.
- Reparations.
- Dissociation.
- Bacteriophage.

**54. When investigating the native material, containing cholera, during phase contracting and dark field microscopy there were found the characteristic bacterial mobility. Which microbial cell peculiarities is this mobility connected with for the causative agent?**

- +Microorganism is monotrichous.
- Microorganism is peritrichous.
- Microorganism is spirilla.
- Microorganism has pili.
- Microorganism has fimbria.

**55. In maternity hospital there was registered episodes of intrahospital staphylococcosis. What kind of staphylococcus strains investigation is preferred to disclose the infection source?**

- +Phagotyping.
- Investigation of biochemical features.
- Study toxin production.
- Sensitivity to antibiotics investigation.
- Antigenic structure investigation.

**56. Bacteriologist applied several drops of 1% carbolic fuchsin on covered with filtering paper preparation of patients phlegm and heated it till fumes emerged. He repeated it three times. After this he removed the paper, dipped the preparation in 5% sulphuric acid, rinsed with water and stained with Loeffler's methylene blue. Which microorganisms is the given staining method used to diagnose?**

- +Mycobacterium tuberculosis.
- Staphylococcus aureus.
- Streptococcus pneumoniae.
- Escherichia coli.

*Klebsiella pneumoniae*.

**57. In material from the patient with diphtheria, during microscopic preparation the bacteriologist found bacillus with clear volutine granules on poles. Which staining method was used by the bacteriologist to disclose the volutine granules?**

+Neisser's.

Gram's.

Burri-Gins'.

Ojeshko.

Ziehl-Neelsen's.

**58. The staphylococcus culture was left at room temperature for a long time. The bacteriologist made the preparation out of it and stained it as per the Gram's method. During microscopy he observed the gram-negative cocci, situated in pairs and in small accumulations. Which variability method was disclosed by the bacteriologist?**

+Modification.

Conjugation.

Mutation.

Transduction.

Transformation.

**59. Bacteriologist in mail dispatched envelopes with powder, containing an anthrax causative agent. The powder is dangerous within long period of time because anthrax causative agent:**

+Forms spores.

Forms flagella.

Forms protein capsule.

Forms polysaccharide capsule.

Is Actinomycete.

**60. At microbiology practical lesson the students should stain the prepared fixed smears of phlegm from the patient with tuberculosis. Which staining method should be applied by the students?**

+Ziehl-Neelsen's.

Burri-Gins'.

Romanowsky-Giemsa's.

Gram's.

Ojeshko.

**61. Last years the causative agents indication method, enabling to disclose in the investigated samples the fragments of pathogens nucleic acid, found its application. Choose from the following reactions the one, suitable for this purpose.**

+Polymerase chain reaction.

Phage titer growing reaction.

Radioimmune assay.

Precipitation reaction.

ELISA.

**62. Immunofluorescence test widely used as an express diagnostics for a number of bacterial and viral infections. Choose the condition, without which it is impossible to consider reaction result.**

+Availability of luminescence microscope.

Availability of light microscope.

Availability of electronic microscope.

Availability of phase-contrast microscope.

Availability of light microscope for dark-field examination.

**63. In the hospital there was conducted instruments sterilization in autoclave quality control with the help of biological method. Which bacteria were used as test microorganisms?**

+Bacteria with spore.

Bacteria with capsule.

Acid resistance bacteria.

Pathogenic bacteria.

Thermophilic bacteria.

**64. For diphtheria causative agents (toxigenic bacteria) the availability of prophage  $tox^+$  gene in bacterial genome is characteristic. Characterize the prophage.**

+Phage DNA is integrated in bacteria cell DNA.

Prophage is fertile in bacterial cell.

Prophage DNA is transcribed independently.



Prophage causes bacterial cells destruction.

May be available in independent state.

**65. From 5-years-old child's nasopharynx the separated microorganism was identified due to its morphological and biochemical peculiarities as *Corynebacterium diphtheriae*, but it does not form exotoxin. Due to which process the given microorganism may become toxigenic?**

+Phage conversion.

Chromosome mutation.

Cultivation on tellurite medium.

Passage via organism of sensitive animals.

Cultivation in presence of antitoxic serum.

**66. In bacteriological laboratory the meat infusion broth was prepared for sterilization. Which sterilization method will you apply?**

+Autoclaving ( $t=121\text{ }^{\circ}\text{C}$ , 30 minutes).

Hot air over ( $t=160\text{ }^{\circ}\text{C}$ , 2 hours).

Boiling in term of 1 hour.

Filtration.

Pasteurization.

**67. In bacteriological laboratory it is needed to sterilize nutritious media, containing substances, modifying at  $100\text{ }^{\circ}\text{C}$  (urea, carbohydrates, proteins). Which sterilization method should be utilized by the bacteriologist?**

+Flowing steam.

Steam under pressure in autoclave.

Boiling.

Tyndalization.

Pasteurization.

**68. To obtain serotoxins from some microorganisms, they are inoculated into liquid nutrient medium, where bacteria are cultivated and emit their toxins. At certain stage it is necessary to eliminate from media the cultivated microbial cells, i.e. to separate toxins from microorganisms. Which appliance will be utilized by the bacteriologist?**

+Seitz filter.

Pasteur's oven.

Krotov's apparatus.

Anaerostat.

Thermostat.

**69. Differential diagnostic media is used for:**

+Evaluation of bacterial fermentation activity.

Microbial biomass accumulation.

Microorganisms pathogenicity evaluation.

Antigenic structure of microorganism's investigation.

Bacteria sensitivity to antibiotics evaluation.

**70. L-form bacteria are:**

+Bacteria without cell wall.

Special form of bacteria colonies.

Branching microbial cells.

Bacteria cells, arranged in smear on the-mitre.

Bacteria, which are difficult to be stained by Gram's method.

**71. Which bacterial cell structure protects it from destruction with microphages?**

+Capsule.

Cell wall.

Flagella.

Fimbria.

Inclusions.