



KISII UNIVERSITY
UNIVERSITY EXAMINATIONS

SPECIAL/SUPPLEMENTARY EXAMINATIONS
FIRST YEAR EXAMINATION FOR THE AWARD OF THE DEGREE OF
BACHELOR OF SCIENCE IN MEDICAL LABORATORY SCIENCES
SECOND SEMESTER, 2024/2025
(AUGUST, 2025)

MELS 161: INTRODUCTION TO MICROBIOLOGY

STREAM: Y1S2

TIME: 2 HOURS

DAY: THURSDAY, 3:00-5:00 PM

DATE: 14/08/2025

INSTRUCTIONS

1. Do not write anything on this question paper.

Section A comprise of M.C.Q.

1. Write the correct answer in the first page of the answer booklet provided.

Section B comprises of Short Easy Questions.

2. Attempt all the questions. Make sure you understand the question before answering.

Section C comprises of Long Easy Questions.

3. Question one is compulsory and choose any other one additional question

SECTION A-MCQS (ANSWER ALL QUESTIONS)-20 MARKS

1. Which of the following is a Gram positive rod & spore forming bacteria?
 - A. Pseudomonas
 - B. Staphylococcus
 - C. Salmonella
 - D. Bacillus
2. Cultures are prepared by penetrating the inoculation loop with suspension into the medium, they are
 - A. Stock cultures
 - B. Stab cultures
 - C. Sub-cultures
 - D. None of these

3. Which of the following antimicrobials acts against Mycobacterium?
 - A. Vancomycin
 - B. Penicillin
 - C. Tetracycline
 - D. Isoniazid
4. Who discovered Small pox vaccine?
 - A. Robert Koch
 - B. Louis Pasteur
 - C. Lister
 - D. Edward Jenner
5. Which of the following organisms is an obligate anaerobe?
 - A. Bacillus
 - B. Staphylococcus
 - C. Clostridium
 - D. Klebsiella
6. Which of the following statements best defines sterilization?
 - A. A process that eliminates many or all pathogenic microorganisms, except bacterial spores, on inanimate objects
 - B. A procedure that removes pathogenic microorganisms from objects so they are safe to handle, use, or discard
 - C. The application of chemicals to destroy most pathogenic organisms on inanimate surfaces
 - D. A process that eliminates all forms of microbial life
7. Which of the following antibiotics act on bacterial cell wall?
 - A. Chloramphenicol
 - B. Rifampin
 - C. Penicillin
 - D. Polymyxins
8. Which of the following organisms is an opportunistic pathogen which is gram negative aerobic rod?
 - A. *V. cholerae*
 - B. *Treponema pallidum*
 - C. *Pseudomonas aeruginosa*
 - D. *Bordetella pertussis*
9. In antimicrobial susceptibility testing, clear-zone formation around antibiotic disc is due to____
 - A. Growth of the bacterium surrounding of the disc
 - B. The destruction of paper disc (antibiotic)
 - C. Lysis of the bacterial cells surrounding the disc
 - D. None of these

10. Who coined the term vaccine?
- A. Robert Koch
 - B. Antony Van Leuwenhoek
 - C. Needham
 - D. Louis Pasteur
11. Chemoheterotrophs are organisms that _____
- A. Utilize energy from inorganic compounds such as hydrogen sulfide
 - B. Utilize the energy of sunlight
 - C. Utilize carbon from organic compounds
 - D. Utilize organic compounds for energy and as a carbon source
12. Who discovered the antimicrobial action of penicillin?
- A. Robert Koch
 - B. Edward Jenner
 - C. Alexander Fleming
 - D. Louis Pasteur
13. Which of the following describes lawn culture method?
- A. Flooding the surface of the plate with a liquid culture or suspension of the bacterium, pipetting off the excess inoculum
 - B. A loopful of culture is made as a primary inoculum and then distributed thinly over the plate by streaking it with the loop in a series of parallel lines in different segments of the plate
 - C. providing a pure growth of the bacterium for slide agglutination and other diagnostic tests
 - D. Prepared by puncturing with a long straight, charged wire in a suitable medium such as nutrient gelatin or glucose agar
14. Which of the following organisms was used by Robert Koch to develop his postulates?
- A. *Bacillus anthracis*
 - B. *Bacillus cereus*
 - C. *Clostridium tetani*
 - D. *Staphylococcus aureus*
15. Visible growth of bacteria on solid medium is known as _____
- A. turbidity
 - B. colony
 - C. sediment
 - D. None of these
16. Culture media are commonly sterilized by:
- A. β -radiation
 - B. Autoclaving
 - C. Hot air oven
 - D. Tyndallization

17. Which of the following antibiotics inhibits cell wall synthesis?
- Erythromycin
 - Streptomycin
 - Trimethoprim
 - Cephalosporins
18. Which of the following is the most active stage in the bacterial growth curve in which maximum growth is attained?
- Lag phase
 - Stationary phase
 - Decline phase
 - Log phase
19. Which of the following is an anaerobic medium?
- EMB agar
 - Mac Conkey broth
 - Robertson's cooked meat medium
 - Mannitol salt agar
20. Which of the following best describes a disinfectant?
- Are chemical agents that eliminate pathogens in the wound
 - Are chemical agents that inhibit or kill microorganisms
 - Are chemical agents that kill the susceptible bacteria
 - Are chemical agents that inhibit the growth of bacteria

SECTION B-SHORT STRUCTURED QUESTIONS (ANSWER ALL QUESTIONS)-20 MARKS

- Highlight the differences between bactericidal and bacteriostatic action of antimicrobial agents (5 marks)
- Outline the stages in disease development (5 marks)
- Highlight the methods used for evaluating and monitoring of sterilization procedures (5 marks)
- Outline the procedure for Gram staining (5 marks)

SECTION C-ASSAY QUESTIONS (QUESTION ONE IS COMPULSORY THEN CHOOSE ANY OTHER ONE QUESTION)-30 MARKS

- Describe bacterial shapes and arrangement (15 marks)
- Discuss laboratory waste management (15 marks)
- Explain bacterial growth curve (15 marks)