

APPLIED BIOLOGY LEVEL 6

SBA 2151

MICROBIAL TECHNIQUES

MARCH/APRIL 2024

MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

WRITTEN ASSESSMENT

TIME: 3 HOURS

INSTRUCTIONS TO CANDIDATES

1. This paper has two sections **A** and **B**.
2. You are provided with separate answer booklet.
3. Marks for each question are indicated.
4. Do not write on the question paper.

SECTION A

Answer all the questions in this section

1. Summarize the disadvantages of chemical sterilants. (3 marks)
2. Identify and explain the use of any **Two** equipment that promote safety in the laboratory. (4 marks)
3. You have accidentally spilled the biosafety level 1 microbial sample on your working bench. Highlight the proper procedure for cleaning such a small spill. (6 marks)
4. Outline the required conditions for steam sterilization. (4 marks)
5. Explain **Two** modes of exposure of infectious agents in the laboratory. (6 marks)
6. Explain any **Three** reasons why bacteria has to be cultured on artificial media. (4 marks)
7. Outline the different techniques of bacterial inoculation. (3 marks)
8. Highlight the principles behind standard viable plate count as a method of bacterial enumeration. (4 marks)
9. Outline any **Two** features that influence the diameter of zone of inhibition in sensitivity test of antimicrobial substances. (2 marks)
10. Explain the differences between Blood and Chocolate agar based on their composition and use. (4 marks)

SECTION B (60 MARKS)

Answer any **three** questions in this section

11. a) To avoid injuries and exposure to pathogenic microbes, the laboratory user must follow the outlined safety rules. Elaborate the microbiological safety rules. (10 marks)
b) Discuss the proper use of Biological Safety Cabinet (BSC) as a safety equipment. (10 marks)
12. a) Culture media can be classified based on various factors. Classify the types of media available based on:
 - i. consistency (6 marks)
 - ii. functional use (6 marks)
b) Discuss the factors that can affect the results of antimicrobial sensitivity test. (8 marks)
13. a) For microbiological work to be done, suitable equipment/instruments must be available. Describe any seven instruments that are used in microbiological laboratory. (14 marks)

- b) Sterilization is important in ensuring high confidence level of the results one can obtain after doing a microbiological experiment. Analyze the routine monitoring of effective sterilization process. (6 marks)
14. a) Discuss the types of laboratories available based on the work done. (12 marks)
- b) Biological laboratories have different biosafety levels based on the microorganism being handled. Discuss the type of these biosafety levels giving at least one example of the microbial agent contained in them. (8 marks)