

KATHMANDU UNIVERSITY
End Semester Examination
June/July, 2023

17 JUL 2023

Level : B.Sc./B.Tech.
Year : II
Time : 2 hrs. 30 mins.

Course : BIOL 207
Semester : II
F. M. : 55

SECTION "B"

[7Q. × 5 = 35 marks]

Attempt *ALL* questions.

1. The following is the scenario in a laboratory. Read the paragraph carefully and answer the following questions accordingly. [5Q. × 1 = 5]
In a microbiology laboratory, a minor accident occurred resulting in the spillage of a bacterial culture. A lab technician accidentally knocked over a culture flask containing a pathogenic bacterium onto the lab bench. The spillage was contained within a small area, but there is a concern about potential contamination and the need for proper disinfection and sterilisation protocols.
 - a. What immediate steps should be taken to address the spillage and ensure the safety of the laboratory personnel and environment?
 - b. What disinfection method(s) would be appropriate to effectively eliminate the spilled pathogenic bacteria from the lab bench and surrounding area?
 - c. Outline the procedure for disinfecting the affected glassware, including the culture flask, to prevent any residual contamination.
 - d. Describe the measures that should be taken to sterilise the lab bench and equipment after the spillage, ensuring a sterile working environment for future experiments.
 - e. What sort of microbes are effective against quaternary ammonium salt?
2. Discuss the application and future of microbiology.
3. What are the rules for the nomenclature of microorganisms? Discuss the key parameters used in identification of medically important bacteria. [2+3]
4. Describe the different phases of the bacterial growth curve. Explain in brief about the factors affecting microbial growth. [3+2]
5. Discuss the steps in the Immune System development.
6. Explain about the Griffith's Experiment including the experiment's interpretation.
7. Discuss about the general characteristics of viruses. Explain in brief about the characteristics of fungi. [3+2]

OR

What are the factors affecting enzyme activity? Discuss in brief about the working mechanism of autoclave. [2+3]

SECTION "C"

8. Write the differences between on *ANY FOUR*. [4Q × 2.5 = 10 marks]
- Symbiosis and Mutualism
 - Active Immunity and Passive Immunity
 - Sterilisation and Disinfection
 - Prokaryotes and Eukaryotes
 - Bacterial Transformation and Bacterial Conjugation
9. Explain WHY/HOW on *ANY FOUR*. [4Q × 2.5 = 10 marks]
- Fungi can form symbiotic relationships with plants, such as mycorrhizae. How does this mutualistic interaction benefit both the fungi and the plants involved?
 - The presence of specific cellular structures, such as pili or flagella, contribute to the ability of bacteria to interact with their environment and colonise different surfaces.
 - 70% ethanol used as disinfectant instead of 100% ethanol.
 - Chloramphenicol is used as the last resort antibiotic.
 - Green Sulphur Bacteria are considered as photoautotrophs.