THE OPEN UNIVERSITY OF SRI LANKA
B.Sc. DEGREE PROGRAMME- LEVEL 5
FINAL EXAMINATION – 2024/2025
BOTANY
BYU5300/BYE5300 - ENVIRONMENTAL AND APPLIED MICROBIOLOGY
DURATION – TWO (02) HOURS

Date – 14th May 2025 **Time – 01.30pm – 03.30pm**

Answer any four (04) questions.

1. a). Many different types of microorganisms thrive in soil. Give a list of the main categories of microorganisms in soil together with their relative proportions of occurrence. (25 marks)

   b). Briefly describe the following antagonistic interactions occurring between the microorganisms in soil.
   i. Ammensalism
   ii. Predation (25 marks)

   c). Using suitable diagrams and named examples, explain how bacteria and cyanobacteria resist unfavorable environmental conditions in soil. (50 marks)

2. a) Briefly describe why it is important to treat sewage (wastewater) before releasing to natural water bodies. (25 marks)

   b) i. List the processes involved in the secondary treatment of municipal wastewater.
   ii Briefly describe three aerobic processes involved in the secondary treatment of municipal wastewater. (75 marks)

3. a). Meat is considered as an excellent growth medium for microorganisms. Give reasons. (30 marks)

   b). Write concisely on microbial spoilage of meat. Include in your answer, the type of spoilage, the microorganisms involved and the biochemical changes that take place in meat during spoilage. (70 marks)

4. Differentiate between the following,

   a. Dermatomycoses and Systemic mycoses
   b. Innate (Natural) immunity and Acquires immunity
   c. Primary immune response and Secondary immune response
   d. Antigens and Antibodies (100 marks)

5. Write short notes of **any three (03)** of the following,

   a. Rhizobium-Legume symbiosis
   b. Single cell protein
   c. Spoilage of canned food
   d. Action of interferons on viruses

(100 marks)

6. a). Genetic engineering is a technique used deliberately to modify a specific characteristic or characteristics of an organism. List the steps to be followed for an organism to be genetically engineered. (30 marks)

   b). Briefly explain the following tools used in Genetic Engineering.

   i. Restriction endonucleases
   ii. DNA ligase
   iii. Vectors (70 marks)