

THE OPEN UNIVERSITY OF SRI LANKA  
 DIPLOMA IN MICROBIOLOGY – LEVEL 3 -2023/2024  
 BYD3314  
 INTRODUCTION TO ADVANCED MICROBIAL TECHNIQUES  
 FINAL EXAMINATION  
 DURATION - TWO (02) HOURS



Reg. No. ....

Date: 08.12.2024

Time: 9.30 am – 11.30 am

Answer **any four (04)** questions, **selecting at least one (01) question from each part (Part A, Part B and Part C)**. Elaborate your answers with suitable diagrams where appropriate.  
 All questions carry equal marks.

**Part A**

- 1) In the last decade, modern biotechnology has become a vital tool in agriculture. Providing suitable examples, describe the use of microbes in improving agricultural productivity. (100 marks)
- 2) Microbes play a key role in the field of medicine. Describe the use of microbes in vaccine production, with suitable examples and highlighting their advantages and disadvantages. (100 marks)

**Part B**

- 3) DNA extraction and amplification of specific DNA sequences are essential steps of the molecular identification process of microbes. Explain the procedures used for DNA extraction and amplification of specific DNA sequences. (50 marks)
- 4) Write short notes on the following;
  - a) Application of microbial biotechnology in biological wastewater treatment. (50 marks)
  - b) Principles and techniques used in blotting techniques. (50 marks)

### Part C

- 5) a) i. What are the two primary mechanisms through which microorganisms produce nanoparticles? (15 marks)
- ii. Give a brief account on **Intracellular** synthesis of nanomaterials. (40 marks)
- b) List the applications of microbial nanotechnology (15 marks)
- c) What are the challenges in microbial nanotechnology (15 marks)
- d) List the future directions for microbial nanotechnology (15 marks)
- 6) a) List **five (05)** natural nanomaterials (15 marks)
- b) List **five (05)** important properties of nanomaterials (15 marks)
- c) Define following terms: (15 marks)
- i. nanofiber
  - ii. nanorod
  - iii. nanocomposite
- d) Briefly explain three main nanomaterial fabrication methods (15 marks)
- e) i. What are the limitations of traditional methods used to make nanomaterials? (15 marks)
- ii. Briefly explain the green synthesis of nanoparticles (15 marks)
- iii. List and briefly explain the phases of green synthesis of nanomaterials (10 marks)

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