

THE OPEN UNIVERSITY OF SRI LANKA
 DIPLOMA IN MICROBIOLOGY – LEVEL 3 -2024/2025
 BYD3314
 INTRODUCTION TO ADVANCED MICROBIAL TECHNIQUES
 FINAL EXAMINATION
 DURATION - TWO (02) HOURS



Reg. No.

Date: 26.07.2025

Time: 9.30 am – 11.30 am

This paper consists of 06 (six) questions and 02 (two) pages.
 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.

Part A

- 1) Microbial biotechnology is used to produce biofertilizers, which are eco-friendly agricultural practices. Explain the use of biofertilizer to enhance agricultural productivity. Your answer should include what biofertilizers are, different types of biofertilizers, application of biofertilizers in agriculture, and the advantages of applying biofertilizers. (100 marks)
- 2) One of the biggest contributions to public health made by medical science is vaccination. Describe the live, attenuated vaccines with suitable examples, highlighting their advantages and disadvantages. (100 marks)

Part B

- 3) a) What is bioremediation? (10 marks)
 b) Explain the mechanisms of bioremediation, giving suitable examples for the microbes involved. (90 marks)
- 4) Write short notes on the following.
 - a) Agarose Gel Electrophoresis (50 marks)
 - b) Polymerase Chain Reaction (50 marks)

Part C

- 5) a) Briefly explain the term "Microbial Nanotechnology" (15 marks)
- b) Describe the process of extracellular synthesis of nanomaterials, including examples. (45 marks)
- c) Briefly explain the mechanisms of microbe-mediated reduction of metals in nanoparticle synthesis? (25 marks)
- d) Stabilizing nanoparticles is very important in microbe-mediated synthesis of nanoparticles, list **three (03)** stabilization agents produced by microbes in nanoparticle synthesis (15 marks)
- 6)
- a) List **two (02)** positive and **two (02)** negative impacts of nanotechnology. (20 marks)
- b) Briefly explain **four (04)** major applications of microbial nanotechnology, providing relevant examples and benefits. (40 marks)
- c) Define the following terms: (15 marks)
- i. Nanomaterial
 - ii. Nanotube
 - iii. Engineered nanomaterials
- d) Discuss the **importance of green synthesis** of nanomaterials (25 marks)

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