



FACULTY OF ALLIED HEALTH SCIENCES, UNIVERSITY OF RUHUNA  
Department of Medical Laboratory Science  
Continuous Assessment – Year 3 Term 1 – 2018/2019 Batch  
MLS 3104 Biotechnology – Theory II (SEQ)

Date: 17<sup>th</sup> of February 2023

Time: 3.15 p.m. – 4.15 p.m.

Duration: 01 hour

Answer all questions

Index Number: .....

1. Cell disruption is an essential part of biotechnology related to the manufacturing of biological products.
  - 1.1 State **three** factors to be considered when selecting a suitable cell disruption technique. **15 marks**
  - 1.2 State **two** disadvantages of each chemical cell disruption techniques mentioned below. **20 marks**
    - a. Osmotic shock
    - b. Use of detergents
  - 1.3 Briefly explain the “**bead milling**” cell disruption technique used for the grinding of animal tissues. **30 marks**
  - 1.4 List **two** other mechanical cell disruption techniques used in crude cell extraction. **10 marks**
  - 1.5 Briefly explain the phenol/chloroform extraction method of DNA. **25 marks**
  
2.
  - 2.1 Define the term genetically modified (GM) organism. **20 marks**
  - 2.2 List **five (05)** benefits of GM foods. **20 marks**
  - 2.3 List **five (05)** factors that considered during risk assessment of GM food. **30 marks**
  - 2.4 Briefly discuss the effects of GM food on human health. **30 marks**



3.

- 3.1 Describe the principles involved in the separation of proteins by ion exchange chromatography. **20 marks**
- 3.2 Explain the importance of dialyzing a protein sample obtained by ammonium sulfate precipitation before subjecting it to ion exchange chromatography? **25 marks**
- 3.3 Explain how SDS-polyacrylamide gel electrophoresis (SDS-PAGE) produces separation of proteins on the basis of subunit size? **25 marks**
- 3.4 Describe the principles involved in protein purification by affinity chromatography. **30 marks**

4. Biotechnology is widely used in vaccine production and antibody production.

- 4.1 Define the term 'Vaccine'. **10 marks**
- 4.2 State **two advantages** and **one disadvantage** of inactivated vaccines over attenuated vaccines. **20 marks**
- 4.3 Briefly explain the important tasks carried out in antibody characterization. **30 marks**
- 4.4 Briefly describe the basis of using selective medium in monoclonal antibody production. **40 marks**

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