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**University Examinations 2023/2024**

**FIRST YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF MASTER OF  
SCIENCE IN MOLECULAR BIOLOGY**

**SIZE 5105: ADVANCES AND TECHNIQUES IN MOLECULAR BIOLOGY I**

**DATE: DECEMBER 2023**

**TIME: 3 HOURS**

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**INSTRUCTIONS:** *Answer question **one** and any other **two** questions*

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**QUESTION ONE (30 MARKS)**

- a) Describe the key factors that influence the choice of subcellular fractionation methods (5 marks)
- b) Discuss the types of information obtained from transmission electron microscopy and scanning electron microscopy (5 marks)
- c) Explain how quantitative analysis is performed using HPLC (5 marks)
- d) Discuss the factors that influence the choice of excitation and emission wavelengths in fluorescence spectroscopy (5 marks)

**QUESTION TWO (20 MARKS)**

Describe the key steps involved in a typical western blotting procedure and the critical factors to consider at each stage (20 marks)

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**MUST is ISO 9001:2015 and**



**ISO/IEC 27001:2013 CERTIFIED**

**QUESTION THREE (20 MARKS)**

- a) Discuss the key parameters for assessing culture performance (10 marks)
- b) Describe how the GC-MS components work together for sample analysis (10 marks)

**QUESTION FOUR (20 MARKS)**

- a) Discuss the fundamental principles of gel filtration chromatography (10 marks)
- b) Describe the principles of detection and quantification in isoelectric focusing (10 marks)



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