



MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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University Examinations 2023/2024

**FOURTH YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR
OF SCIENCE IN BIOCHEMISTRY AND BACHELOR OF BIOTECHNOLOGY**

SHC 3402: INTEGRATED BIOCHEMICAL TECHNIQUES III

DATE: DECEMBER 2023

TIME: 2 HOURS

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

QUESTION ONE (30 MARKS)

- a) Explain the significance molecular biology techniques in studying genetic information (3 marks)
- b) Describe the information obtained from gel electrophoresis experiments (3 marks)
- c) Outline the applications of polymerase chain reaction (3 marks)
- d) Explain the potential sources of contamination during nucleic acid isolation (3 marks)
- e) Clarify the role of dideoxynucleotides (ddNTPs) in sanger sequencing method (3 marks)
- f) Outline the features of plasmids that make them suitable cloning vectors (3 marks)
- g) Explain at least three areas where recombinant DNA technology can be applied (3 marks)
- h) Describe briefly indirect ELISA (3 marks)



MUST is ISO 9001:2015 and



ISO/IEC 27001:2013 CERTIFIED

- i) Explain the medical importance of organ tests (3 marks)
- j) Categorize special-purpose media used in the isolation and identification of specific microorganisms (4 marks)

QUESTION TWO (20 MARKS)

- a) Discuss the advantages and limitations of flow cytometry (8 marks)
- b) Describe different types of cloning vectors and their applications (12 marks)

QUESTION THREE (20 MARKS)

- a) Discuss the key liver function tests used in diagnosis of liver disease (10 marks)
- b) Describe the steps involved in the development of a recombinant DNA (10 marks)

QUESTION FOUR (20 MARKS)

- a) Describe the steps involved in establishing a pure culture from a mixed microbial population (10 marks)
- b) Compare and contrast immune electrophoresis and immunoprecipitation (10 marks)

