



# MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

P.O. Box 972-60200 – Meru-Kenya

Tel: +254(0) 799 529 958, +254(0) 799 529 959, + 254 (0) 712 524 293,

Website: [info@must.ac.ke](mailto:info@must.ac.ke) Email: [info@must.ac.ke](mailto:info@must.ac.ke)

---

## University Examinations 2022/2023

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

### SZE 5154: ADVANCES IN MOLECULAR BIOTECHNIQUES II

DATE: APRIL 2023

TIME: 3 HOURS

---

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

---

#### QUESTION ONE (20 MARKS)

- a) Describe the procedure for designing a primer (5 marks)
- b) Discuss two main approaches for germplasm conservation (5 marks)
- c) Describe different cloning vectors used in recombinant DNA technology (5 marks)
- d) Discuss the different steps of construction of cDNA library (5 marks)

#### QUESTION TWO (20 MARKS)

Discuss the applications of Polymerase Chain Reaction in different fields (20 marks)

#### QUESTION THREE (20 MARKS)

- a) Discuss various DNA markers used in Molecular Biology (10 marks)
- b) Discuss quantification techniques for nucleic acids (10 marks)

#### QUESTION FOUR (20 MARKS)

- a) Discuss the following:
    - (i) Next-Generation sequencing based immunodetection (6 marks)
    - (ii) Immunosensors based immunodetection (6 marks)
- 

Meru University of Science & Technology is ISO 9001:2015 Certified

Foundation of Innovations

Page 1

- b) Discuss applications of tracer techniques in diagnostic, therapeutic and agricultural applications (8 marks)