



# MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

THIRD YEAR SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN BIOLOGY

SZL303:INTRODUCTION TO MOLECULAR BIOLOGY

DATE: 17/3/2022

TIME : 2:00 – 4:00 PM

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## Instructions

1. Answer Question 1 (**compulsory**) and **any two** questions in Section B.
2. Use clean well labelled diagrams wherever appropriate.

## SECTION A Question 1. – Compulsory (30 marks)

- i. Differentiate between the following:
  - a. *lytic* and *lysogenic* life cycle of a bacteriophage (2 marks)
  - b. *Plasmid* and a *transposon* (2 marks)
  - c. *Nucleoside* and *nucleotide* (2 marks)
- ii. Outline any three practical applications of molecular techniques. (3 marks)
- iii. Briefly describe DNA cloning (3 marks)
- iv. Describe the structure of the cell nucleus (3 marks)
- v. Outline the principal uses of gel electrophoresis (3 marks)
- vi. Explain why the genetic code is described as *degenerate* (3 marks)
- vii. Explain what are GMOs (3 marks)
- viii. Outline reverse transcriptase (3 marks)
- ix. Outline any three applications of ELISA in medical practice. (3 marks)

## SECTION B

2. Discuss the principle and the procedure of molecular cloning (20 marks)
3.
  - a. Discuss the replication of a named bacteriophage (10 marks)
  - b. Describe hydrogen bonding in the structure of DNA (10 marks)
4. Discuss the procedure of a named PCR (20 marks)
5.
  - a. Compare the processes of transcription and translation in DNA (10 marks)
  - b. Discuss the formation of a polypeptide chain in eukaryotic cells (10 marks)