



**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR**

FIRST YEAR SECOND SEMESTER EXAMINATIONS

**MAIN EXAMINATION
FOR THE DEGREE
OF
BACHELOR OF SCIENCE BIOTECHNOLOGY**

COURSE CODE: SBT 121

COURSE TITLE: FOUNDATIONS OF MOLECULAR BIOLOGY

DATE: WEDNESDAY, 20TH APRIL 2022 TIME: 3:00 – 5:00 P.M.

INSTRUCTIONS TO CANDIDATES

Question ONE is compulsory

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 3 Printed Pages. Please Turn Over.

SECTION A (SHORT ANSWER QUESTIONS, 40 MARKS)

1. Describe the TEN (10) universal features of cells. [5 marks]
2. Describe the characteristics of the various enzymes used for dicing, splicing, and reversing nucleic acids. [4 marks]
3. Describe the theory and practice behind gel electrophoresis. [5 marks]
4. Using a diagram, describe the eukaryotic cell cycle. [5 marks]
5. Describe the Central Dogma of Molecular Biology. [3 marks]
6. Using a flow chart diagram, outline the common tools of molecular biology. [3 marks]
7. Write brief notes on each of the following processes;
 - a. DNA finger printing [1 mark]
 - b. Recombinant DNA technology [1 mark]
 - c. The Polymerase Chain Reaction [1 mark]
 - d. DNA Sequencing [1 mark]
 - e. Nucleic Acid Hybridisation [1 mark]
8. Describe the most salient features of a genetic code and complete the genetic code table below. [5 marks]

		Second letter →				
		U	C	A	G	
First letter →	U					U C A G
	C					U C A G
	A					U C A G
	G					U C A G

9. Using a flow chart diagram, demonstrate the organisation of the human genome. [3marks]
10. Name the THREE types of RNAs and briefly describe the properties of each. [3marks]

SECTION B: (ESSAY QUESTIONS, 30 MARKS)

11. Describe the key steps of the following processes; [15 marks]
 - a. DNA Transcription

b. RNA Translation

12. Describe the Meselson and Stahl experiment on DNA replication. [15 marks]
13. Draw the three dimensional molecular structure of the DNA molecule and describe its most unique characteristics. [15 marks]