



MASENO UNIVERSITY
UNIVERSITY EXAMINATIONS 2016/2017

**FIRST YEAR FIRST SEMESTER EXAMINATIONS FOR THE
DEGREE OF BACHELOR OF SCIENCE AND BACHELOR OF
EDUCATION SCIENCE WITH INFORMATION TECHNOLOGY**

MAIN CAMPUS

**SZL 103: INTRODUCTION TO GENETICS AND
EVOLUTION**

Date: 30th November, 2016

Time: 3.30 - 6.30 pm

INSTRUCTIONS:

- Answer ALL questions in SECTION A (3 marks each) and any TWO in SECTION B (20 marks each).



1th YEAR 1st SEMESTER 2015/2016 ACADEMIC YEAR

SZL 103: INTRODUCTION TO GENETICS AND EVOLUTON

Time: 2 Hrs

INSTRUCTIONS: Answer ALL questions in section A (3marks each) and any Two (2) in section B (20 marks each).

1. Explain any three limitations of using fossils to show evolutionary relationships.
2. Briefly explain why small populations of organisms often have low genetic variation.
3. Explain the difference between the evolution of biological entities and metaphorical evolution of human culture such as language.
4. Explain any three principles that govern evolution of genes at the molecular level
5. Briefly explain how phylogenetic studies have revolutionarised systematics and taxonomy in evolutionary perspective.
6. Briefly explain the application of evolution in (a) forensic science and (b) conservation of biodiversity
7. Distinguish among allopatric, sympatric, and parapatric hypotheses of speciation.
8. The F₂ progeny of a phenotypically blue, large petalled plant yielded the following number of phenotytes in the progeny.

Blue large – 182

Blue small – 60

White large – 57

Use a chi-square (χ^2) to determine whether these results represent 9:3:3:1 ratio

9. Explain the two main characteristics of extra-chromosomal inheritance while highlighting why mitochondrial DNA evolution differs from that of nuclear DNA.
10. Briefly explain any three applications of polyploidy in aquaculture.

Section B: Answer any two (2) questions (20 marks each)

11. Discuss the main forms of pre-zygotic and post-zygotic isolation mechanisms and how they contribute to speciation or extinction of species.
12. Discuss the significant role of evolution in public health and medicine.
13. Discuss adaptive radiation with relevant examples in fish and birds.
14. Give a detailed account of any five gene interactions and exceptions to Mendelian inheritance.