MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2013/2014

THIRD YEAR FIRST SEMESTER EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE IN MEDICAL LABORATORY SCIENCE; PHARMACEUTCAL SCIENCE AND MEDICAL BIOTECHNOLOGY WITH INFORMATION TECHNOLOGY

PMT 310: PRINCIPLES OF GENETICS

Date: 1st April, 2014 Time: 8.30 – 10.45 a.m.

2013/2014 ACADEMIC YEAR
PMT 310: PRINCIPLES OF GENETICS
SECTION A {40 MARKS}

Attempt ALL questions. Each question carries 5 marks. Illustrate your answers with labeled diagrams where necessary.

Q1. Describe in details the process of assaying DNA variation using PCR technique.

Q2. Describe the Synthetic theory of evolution, state the Hardy-Weinberg equilibrium (HWE) principle and indicate the 7 (seven) conditions in nature that permit the HWE principle.

Q3. Describe one phenomenon in which the effects of multiple alleles of one gene are demonstrated.

Q4. Outline Mendel's revolutionary findings in genetics.

Q5. Discuss in details three (3) main ways of generating genetic ratios in a population.

Q6. Using relevant examples, describe the continuous variation in polygenic inheritance as applied in genetics.

Q7. Using a relevant example, describe epistasis.

Q8. Differentiate between:
a) Genotype and phenotype
b) Locus and alleles

SECTION B {30 MARKS}

Attempt any TWO questions in this section. Each question carries 15 marks. Illustrate your answer with labeled diagrams where necessary.

Q9. Discuss ways in which small population size affects evolution.

Q10. Discuss with empirical examples how selections against the following affect gene frequency in the population:
a) Selection against one of the homozygotes
b) Selection against the heterozygotes

Q11. Describe in details the potential ways in which genetic inheritance can affect the following behavioral traits:
a) Alcoholism
b) Gayness
c) Violence