TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR:

BACHELOR OF SCIENCE FOOD TECHNOLOGY AND QUALITY ASSURANCE

AAB 4108: INTRODUCTION TO GENETICS PAPER II

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2016

TIME: 2 HOURS

DATE: Dec 2016

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

Question ONE

a) Differentiate between:

i) Homozygote and heterozygote (1 marks)

ii) Linkage and crossing over (1 marks)

iii) Autosomal and sex-liked patterns of inheritance (1 marks)

iv) Repressors and inducers (1 marks)

b) The gene for yellow body ***y*** colour in *Drosophila* is recessive and sex-linked. Its dominant allele y^+ produces wild type body colour. What phenotypic ratios are expected from the crosses?

   i) Yellow female x wild type male (1 mark)

   ii) Wild female (homozygous) x yellow male (1 mark)

   iii) Wild type (carrier) female x wild type male (1 mark)

   iv) Wild type (carrier) female x yellow male (1 mark)

c) Outline the major differences between meiosis and mitosis (4 marks)

d) Explain the tenets of Darwin's theory of natural selection (4 marks)

e) Differentiate between incomplete dominance and codominance giving examples (4 marks)

f) Outline the differences between B-DNA and Z-DNA (4 marks)

g) Distinguish between negative and positive regulation of gene action using suitable illustrations (6 marks)

Question TWO

a) Classify mutations on the basis of the following features:

   i) Consequent change in amino acid sequence (4 marks)

   ii) Magnitude of phenotypic effect (4 marks)

   iii) Mode of origin (2 marks)

   iv) Size and quality of mutation (2 marks)

b) Highlight the differences between conservative and semi-conservative modes of DNA replication (8 marks)

Question THREE

a) Define Meiosis (2 marks)

b) Using appropriate diagrams, describe the processes involved in meiotic cell division (18 marks)

Question FOUR

a) Describe the factors affecting the stability of gene frequencies in a population (12 marks)

b) Explain the phenomenon of complete and incomplete linkages giving suitable examples (8 marks)

Question FIVE

a) Describe the processes of genetic map construction (12 marks)

b) Outline the different types of isolation which causes speciation (8 marks)