



Technical University of Mombasa

Faculty of Applied and Health Sciences

DEPARTMENT OF PURE AND APPLIED SCIENCES
UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF
SCIENCE IN COMMUNITY HEALTH
BSCH 13M

AAB 4106 : HUMAN GENETICS

SEMESTER : EXAMINATION

APRIL 2014 SERIES

2 HOURS

Instructions to candidates:

This paper consists of **FIVE** questions

Answer question **ONE** (compulsory) and any other **TWO** questions

QUESTION ONE

- a) Define the following terms :
 - (i) Polygenic inheritance (1 mark)
 - (ii) Point mutation (1 mark)
 - (iii) Gene therapy (1 mark)
- b) Illustrate diagrammatically the basic structure of a chromosome. (2 marks)
- c) In a disputed parentage cases the child is blood type O while the mother is type A. Determine the blood type that would exclude a male from being the father. (3 marks)
- d) Using examples in human beings, explain how pleiotropy affects phenotypic traits

(3)

marks)

- e) Describe briefly the following conditions
 - (i) Sickle cells anaemia (2 marks)
 - (ii) Phenylketonuria (PKU) (2 marks)
- f) Outline the importance of genetic polymorphisms in human populations (3 marks)
- g) Describe the mechanism of DNA damage by:
 - (i) Ultraviolet radiations (2 marks)
 - (ii) Ionizing radiations (2 marks)
- h) Describe briefly the application of biochemical markers in disease identification (3

marks)

- i) Explain how chemical methods are used in gene transfer (3 marks)
- j) Explain the term genetic finger printing (2 marks)

QUESTION TWO

- a) Using illustrations, explain the process of DNA replication. (7 marks)
- b) Describe briefly the concept of regulation of gene expression (7 marks)
- c) Describe briefly the steps involved in genetic engineering (6 marks)

QUESTION THREE

- a) Using examples, discuss the inheritance of sex-linked genes in humans (10 marks)
- b) Describe briefly any three chromosomal abnormalities in humans (10 marks)

QUESTION FOUR

- a) Discuss the sources of induced gene mutations. (11 marks)
- b) Discuss the factors hindering gene therapy from becoming an effective treatment for genetic diseases. (9 marks)

QUESTION FIVE

Discuss the application of biotechnology in human health.

(20 marks)