KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2017/2018

FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE (ENVIRONMENTAL HEALTH)

HEH 409: BIOTECHNOLOGY AND HEALTH

DATE: Wednesday 7th February 2018 **TIME: 2.00 p.m. - 4.00 p.m.**

INSTRUCTIONS:

SECTION I (20 MARKS) Answer ALL questions

1. (a) Giving an example explain the concept of base pairing in DNA structure (1 mark)

   (b) Using illustrations in each case:

   (i) Describe ~~four~~ types of chromosomal structural abnormalities (4 marks)

   (ii) Explain the theories of DNA replication (5 marks)

   (c) Using a pedigree diagram illustrate the following

   (i) X-linked recessive inheritance (2 marks)

   (ii) Autosomal dominant inheritance (2 marks)

   (d) Outline six characteristics of the genetic code (3 marks)

   (e) Giving examples in each case explain the three basic types of point mutations (3 marks)

SECTION II

This section has two parts. Answer ALL questions in part I and any 2 in part II

PART I (20 MARKS)

2. Giving examples in each case, discuss the following applications of genetic engineering
   (i) Agriculture (7 marks)
   (ii) Medicine (7 marks)
   (iii) Industry (6 marks)

PART II

3. Discuss the three stages of biotechnology development giving examples in each case (15 marks)

4. Mr. and Mrs. KU wish to start a family; however they have a family history of genetic disorders on both sides and want to undergo genetic testing before getting pregnant. As a genetic testing counselor:-
   (i) Explain to the couple how genetic testing is done (5 marks)
   (ii) The process of informed consent and the actors that are included (6 marks)
   (iii) What the results of the genetic test can mean (4 marks)

5. Discuss gene therapy under the following
   (i) How gene therapy works (7 marks)
   (ii) The ethical issues surrounding gene therapy (4 marks)
   (iii) Factors that have hindered gene therapy from becoming an effective treatment for genetic diseases (4 marks)