



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2016/2017

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

HEH 409: BIOTECHNOLOGY AND HEALTH

DATE: Wednesday, 10th May, 2017

TIME: 4.30 p.m. - 6.30 p.m.

INSTRUCTIONS:

SECTION A:

Answer **ALL** questions - (20 marks)

- Q.1
- a) Outline any three causes of chromosomal disorders (3 marks)
 - b) Describe the thermal properties of DNA (3 marks)
 - c) Explain how the structure of DNA can be analyzed (3 marks)
 - d) Explain the methods used in screening transformants (3 marks)
 - e) Explain the meaning of the following terms
 - i) Gene Locus
 - ii) Microsatellites(2 marks)
 - f) Outline the features of ribosomal RNA (rRNA). (3 marks)
 - g) State the goals of the Human Genome Project (3 marks)

SECTION B:

Answer question **ONE (Compulsory)** (20 marks) and any other **TWO** questions (15 marks each)

- Q.1
- a) Describe the use of the following methods in gene transfer processes.
 - i) Electroporation
 - ii) Chemical transformation
 - iii) Liposome fusion with protoplast(5 marks)
 - b) Explain the following types of chromosomal aberrations
 - i) Patau syndrome
 - ii) Edward's syndrome
 - iii) Turner's syndrome(5 marks)

- c) Using a classical case, discuss Gene therapy. (6 marks)
- d) Explain any two ethical aspects of DNA manipulation with regard to environmental concerns. (4 marks)
- Q.2 a) Describe the indirect method of genetic transformation. (5 marks)
- b) Discuss DNA fingerprinting and explain how it is used in paternity testing. (10 marks)
- Q.3 a) Describe the polymerase chain reaction (PCR) procedure. (6 marks)
- b) Outline the desirable features of cloning vectors. (3 marks)
- c) Describe how a recombinant DNA can be created. (6 marks)
- Q.4 a) Write explanatory notes on restriction enzymes. (6 marks)
- b) Discuss the structure and nomenclature of Nucleotides and explain how they differ from nucleosides. (9 marks)
- Q.5 Discuss the use of genetic engineering technology in the following:
- i) Waste disposal industry
- ii) Hormone production
- iii) Prenatal screening of genetic diseases
- (5 marks each)