NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF APPLIED SCIENCES

BACHELOR OF SCIENCE HONOURS DEGREE EXAMINATIONS

DEPARTMENT OF APPLIED BIOLOGY AND BIOCHEMISTRY

THEORY: GENETICS SBB 1204

DECEMBER 2005

2 HOURS (100 marks)

INSTRUCTIONS

Answer Four (4) Questions. Each question carries 25 marks. Where a question contains subdivisions, the mark value for each subdivision is given in brackets. Illustrate your answer where appropriate with large, clearly labelled diagrams.

1.(a) Discuss the application of isozymes in establishing certain phenotypes. (13 marks)

(b) How could you establish if a transposon has been inserted in a particular locus within the plant genome. (12 marks)

2. Write an essay on chromosomal aberrations.

3.(a) In a family two boys expressed the sickle cell phenotype and three girls did not. Answer and explain the following:

(i) Does it mean both parents carry the sickle gene? (4 marks)
(ii) Can it be reasonably suggested that the girls carry the sickle gene? (4 marks)
(iii) Is the sickle cell gene sex linked. (3 marks)
(iv) What is pleitropy? (4 marks)

(b) Describe DNA sequencing by the chemical degradation method. (10 marks)

4.(a) Describe sex determination in animals. (10 marks)

(b) What would be the sex and phenotypes expressed by people with the following genotypes:

(i) XXY (3 marks)
(ii) XXXY (3 marks)
(iii) XO (3 marks)
(iv) XXXX (3 marks)
(v) XYY (3 marks)

5.(a) Discuss the arrangement of chromatin within the nucleus. (13 marks)

(b) What are the consequences of non-disjunction to the offspring? (12 marks)

6. Write an essay on point mutations.

END OF EXAMINATION

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