

Cork Institute of Technology

Bachelor of Science (Honours) in BioSciences - Award

(NFQ Level 8)

Spring 2007

Molecular Genetics & Cell Biology

(Time: 3 hours)

Answer FOUR Questions.

Question ONE is Compulsory.

Answer ONE question from Section A & B and

One other question from either Section.

Examiners : Dr. T. Beresford

Dr. H. O'Shea

Dr. R. Sleator

Use separate answer books for each section.

- Q1. (a) Describe the experiment which led to the cracking of the genetic code.
- (b) Define the terms **Karyotype**, **Karyogram** and **Idiogram**.
- (c) Define the terms **Heterochromatin** and **Euchromatin**.
- (d) Define **Kosnmbis' function** and use it to determine the genetic map distance between two loci with a recombination frequency of 0.1.
- (e) Describe the genotype for the following **45XY,-14,-21 +t (14q21q)**.
- (f) Describe how the immune system attacks large parasites.
- (g) Briefly discuss the main components of the cytoskeleton.
- (h) Outline the standard test of cell determination.
- (i) Discuss the stages of apoptosis.
- (j) Discuss, using examples, the genetic mechanisms underlying retinoblastoma.

(Question 1 carries 40 marks)

Section A (Molecular Genetics)

Answer at least one question from this section. Each question carries 20 marks.

- Q2. Outline and discuss, with the aid of diagrams, the structures necessary for functional eukaryotic chromosome
- Q3. Write an essay on large scale DNA sequencing with reference to the Human Genome Project.
- Q4. Outline how distance is measured on the genetic map.

Section B (Cell Biology)

Answer at least one question from this section. Each question carries 20 marks.

- Q5. Complement plays a crucial role in both the Innate and Acquired Immune response. Comment on this statement, illustrating your answer using diagrams, where possible.
- Q6. Describe the stages of development in animals.
- Q7. Describe the main events in the standard eukaryotic cell cycle.