

Cork Institute of Technology
Bachelor of Science in (Honours) in Applied Biosciences - Award
(NFQ - Level 8)
Spring 2006
MOLECULAR GENETICS & CELL BIOLOGY
(Time: 3 hours)

Answer Question 1 and **three** others choosing
one question from each of sections A & B.
Use separate answer books for each section.

Examiners : Dr. T. Beresford
Dr. H. O'Shea
Dr. R. Sleator
Dr. H. Tarrant

Q1.

- (i) Describe the experiment which proved that DNA is the hereditary material.
- (ii) What is meiotic recombination? How is this event linked to the construction of genetic maps?
- (iii) Outline the Sanger dideoxy chain termination sequencing method.
- (iv) Using Haldane's function work out the genetic map distance between two loci with a recombination frequency of 0.1.
- (v) Give the Karyotype designation for the following genotype:
45XY, -14, -21 +t(14q21q)
- (vi) Write a brief note commenting on microtubules.
- (vii) Describe the species used in the study of development.
- (viii) Discuss the Molecular Basis of Cell Cycle Regulation.
- (ix) Define the term membrane potential. With the aid of a diagram, describe the ion distribution in the resting neuron which gives rise to the resting membrane potential.
- (x) Describe, with the aid of diagram(s), the changes in ion channel permeability and current flow that occurs during the three main phases of the action potential.

Section A (*Molecular Genetics*)

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

- Q2. Write an essay on the genetic code and the experiments which led to its resolution.
- Q3. Write an essay on genetic mapping.
- Q4. Write an essay on Gene Therapy.

Section B (*Cell Biology*)

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

- Q5. Describe the stages of development in animals.
- Q6. Discuss Antigen Processing and Presentation.
- Q7. “Viruses contribute to cancer”. Discuss this statement.