

*Ollscoil na hÉireann, Gaillimh.*

**NATIONAL UNIVERSITY OF IRELAND, GALWAY**

---

**SUMMER EXAMINATIONS, 2002**

---

**FIRST-YEAR BIOMEDICAL ENGINEERING**

**Biology BO106**

Time allowed: *Three* hours.

Answer *five* questions, at least *two* from each section.

**Use a separate answer book for *each* section.**

**Section A**

Professor M. Zalewski  
and internal examiners

- Q 1. Describe in illustrated detail the structure and functions of the plasma membrane and the extracellular matrix of the animal cell.
- Q 2. List the main tissue types in the vertebrate body and describe the mineralized tissue, bone, in illustrated detail.
- Q 3. Describe with the aid of diagrams the human digestive tract, emphasizing the functional capabilities of its component parts.
- Q 4. Briefly describe the human kidney and give an account of the production of urine from the blood filtrate.
- Q 5. Give an account of each component of the non-specific defenses of the human body.

**Section B**

Professor M. Dring, Professor C. Brown, Dr. D. Apps,  
and internal examiners.

- Q 6. Give an account of the asexual life cycle of *Aspergillus* and *Penicillium*. Illustrate your answer and comment on the biotechnological importance of these fungi.

**PTO**

- Q 7. Write an essay on "The Structure of Bacteria".
- Q 8. Write an essay on "The Consequences of the Non-Disjunction of Human Chromosomes".
- Q 9. Write an essay on "Enzymes".
- Q 10. Answer **two** of the following:
- (a) Describe the four levels of protein structure.
  - (b) ATP is the energy currency of the cell. Explain.
  - (c) Describe the process of DNA replication.
  - (d) Outline the basic steps of gene cloning and discuss some beneficial applications of this technology.