

# Cork Institute of Technology

## Bachelor of Science in Applied Biosciences and Biotechnology - Award

(NFQ – Level 7)

Spring 2007

### Microbiology

(Time: 3 Hours)

Answer **five** questions in total.  
Answer **two** questions from Section A,  
And **two** questions from Section B, and  
**one** other question from either Section.

Examiners: Dr. T. Beresford  
Dr. D. Gilroy  
Ms. M. Lane

Use separate answer books for each Section.

### Section A

- Q1. Write brief notes on the following topics relating to pharmaceutical products:
- (i) Sterility testing
  - (ii) Validation of sterilisation methods (20 marks)
- Q2. Discuss the principle and applications of automated electrical techniques for microbiological analysis. (20 marks)
- Q3. Describe each of the following techniques:
- Biolog
  - ATP bioluminescence
  - MPN
  - ELISA (20 marks)
- Q4. (a) Write notes on each of the following:
- Restriction endonucleases
  - Nucleic acid hybridisation
  - Polymerase chain reaction (15 marks)
- (b) Describe a three class-sampling plan. (5 marks)

## Section B

Q5. Describe two mechanisms by which bacteria can control the synthesis of enzymes at the genetic level in response to the nutrients available in the environment. (20 marks)

Q6. Write a descriptive account of protein synthesis in prokaryotes. (20 marks)

Q7. Write descriptive accounts of the following pathogenic organisms.  
*E coli* 0157  
*Campylobacter jejuni* (20 marks)

Q8. Write brief notes on;  
(a) The steps involved when organisms initiate pathogenic infections.  
(b) Endotoxins  
(c) LAL test  
(d) Exotoxins (20 marks)