

Cork Institute of Technology

Bachelor of Science in Applied Biosciences and Biotechnology - Award

(NFQ – Level 7)

Autumn 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. (a) Describe the differences that exist between 2 and 3 class sampling plans and provide an example of each. (16 marks)
- (b) Describe how a sampling plan can be made more stringent. (4 marks)
- Q2. Write short notes on each of the following:
- Restriction endonucleases
 - Gel electrophoresis
 - Nucleic acid hybridisation
 - Polymerase chain reaction
- (20 marks)
- Q3. Describe the principle and microbiological applications of two of the following techniques:
- (i) enzyme linked immunosorbent assay
 - (ii) ATP bioluminescence
 - (iii) Indirect conductimetry
- (20 marks)
- Q4. (a) With the aid of a diagram, describe the design of a clean room facility for the production of a sterile pharmaceutical product. (10 marks)
- (b) Why is validation important within the biopharmaceutical industry? (10 marks)

Section B

- Q5. (a) Describe with the aid of diagrams how the presence and absence of lactose and glucose regulates the production of catabolic lactose enzymes in *E coli* (12 marks)
- (b) Describe how the presence and absence of tryptophan regulates the tryptophan operon in *E- coli*. (8 marks)
- Q6. Describe Initiation, Elongation and Termination as they occur in translation during protein synthesis in prokaryotes. (20 marks)
- Q7. Write brief notes on:
- (a) The LAL test (5 marks)
 - (b) *Yersinia* (5 marks)
 - (c) *Campylobacter* (5 marks)
 - (d) Exotoxins (5 marks)
- Q8. Write an account of *Salmonella* using the following headings:
- General characteristics
 - Features of illness caused
 - Foods with which *Salmonella* is associated
 - Control of *Salmonella* infections
 - Methods used to isolate *Salmonella* from foods

(20 marks)