

# Cork Institute of Technology

## Bachelor of Science in Applied Biosciences & Biotechnology

(SBIBI\_7\_Y3)

Autumn 2008

### **Microbiology**

(Time: 3 Hours)

Answer 5 Questions in total.

Answer 2 questions from section A and

2 questions from section B;

and one other question from either section.

Use separate answer books for each section

Examiners: Dr D.Gilroy

Ms M. Lane

Dr T. Beresford

### Section A

- Q1. (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)
- Q2. Write a descriptive account of protein synthesis in Procaryotes. (20 marks)
- Q3. Write brief notes on:
- (a) The steps involved when organisms initiate pathogenic infections.
  - (b) Endotoxins
  - (c) LAL test
  - (d) Exotoxins
- (20 marks)

Q4. Write an account of Salmonella using the following headings:

- (a) General Characteristics
- (b) Features of illness caused
- (c) Foods with which salmonella is associated
- (d) Control of salmonella infections
- (e) Methods used to isolate salmonella from foods.

(20 marks)

## Section B

Q5. (i) Describe the differences that exist between 2 and 3 class sampling plans and provide an example of each.

(16 marks)

(ii) Describe how a sampling plan can be made more stringent.

(4 marks)

Q6. Write short notes on each of the following:

- Restriction endonucleases
- Gel electrophoresis
- Nucleic acid hybridisation
- Polymerase chain reaction

(20 marks)

Q7. 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)

Q8. (i) With the aid of a diagram, describe the design of a clean room facility for the production of a sterile pharmaceutical product. (10 marks)

(ii) Why is validation important within the biopharmaceutical industry? (10 marks)