

CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ

Examinations 2007/08

Module Title: Microbiology

Module Code: **MBIO S3001**

School: Science

Programme Title: Bachelor of Science in Applied Biosciences & Biotechnology - Award

Programme Code: SBIBI_7_Y3

External Examiner(s): Dr. T. Beresford

Internal Examiner(s): Dr. D. Gilroy, Ms. M. Lane

Instructions: Answer **Five** questions.
Answer **two** questions from section A and **two** questions from
section B and **one** other question from either section.
Use separate answer books for each Section.
All questions carry equal marks.

Duration: **3 HOURS**

Sitting: Winter 2007

Requirements for this examination:

Note to Candidates: Please check the Programme Title and the Module Title to ensure that you have received the correct examination paper.
If in doubt please contact an Invigilator.

Section A

- Q1. Using specific examples write a short descriptive account of each of the following:
- (a) Inducible Operon
 - (b) Catabolite repression
 - (c) End product repression
 - (d) Attenuation
- (20 Marks)
- Q2. Write descriptive notes on each of the following:
- (a) Initiation of transcription in prokaryotes
 - (b) Termination of transcription in prokaryotes
 - (c) RNA polymerase
 - (d) Initiation of translation in prokaryotes
- (20 Marks)
- Q3. (a) Write an account of Endotoxins and discuss their importance and detection in the pharmaceutical industry. (12 marks)
- (b) Briefly describe the general categories of Exotoxins. (8 marks)
- Q4. Write a detailed account of *S. aureus*. (In your answer mention)
- General Characteristics and Habitat
 - Infections and illnesses caused by *S aureus*
 - Methods of identification
 - Staphylococcal enterotoxins
- (20 marks)

Section B

- Q5. (i) Design a sampling plan you would use in order to screen for the presence of *Salmonella* in a product. (6 marks)
- (ii) Describe how a 3-class sampling plan can be made more stringent. (5 marks)
- (iii) Provide an example of a biochemical test used to differentiate between *Escherichia coli* and *Enterobacter aerogenes*. (4 marks)
- (iv) Outline the principle of the Biolog system used for microbial identification. (5 marks)

- Q6. 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)

- Q7. Discuss sterility testing in the biopharmaceutical industry and outline the use of biological indicators to assess the effectiveness of various sterilisation methods.

(20 marks)

- Q8. Write short notes on each of the following:

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

(20 marks)