

**CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ**

Autumn Examinations 2013

Module Title: Analytical Microbiology

Module Code: BIOM 7001

School: Science

Programme Title: Bachelor of Science in Applied Biosciences with Biotechnology
Bachelor of Science (Honours) in Pharmaceutical Biotechnology
Bachelor of Science in Analytical and Pharmaceutical Chemistry
Bachelor of Science (Honours) in Analytical Chemistry with Quality Assurance

Programme Code: SBIBI_7_Y3, SPHBI_8_Y3, SCHEM_7_Y3, SCHQA_8_Y3

External Examiner(s): Dr. Gillian Gardiner

Internal Examiner(s): Dr. Brigid Lucey

Instructions: Answer 3 questions, one from section A, one from Section B, and the remaining question from either A or B. Each question carries equal marks.

Duration: 2 Hours

Sitting: Autumn 2013

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. In Industry:

- (a) List the personnel that are important in ensuring quality in the final product. (4 Marks)
- (b) Outline the microbiological considerations that are important in pharmaceutical manufacture. (10 Marks)
- (c) Describe briefly how particle counters work. (9 Marks)
- (d) Outline the importance of having positive and negative pressure in cleanrooms, giving examples of how and where these strategies are used. (10 Marks)

Q2. Standard operating procedures (SOP) are important in cleanrooms.

- (a) Define what is meant by a Standard Operating Procedure. (8 Marks)
- (b) Give an example of a microbiologically-based SOP that would be expected in the cleanroom. (11 Marks)
- (c) Discuss the implications of false positive and false negative results generated in the laboratory of a pharmaceutical company. (14 Marks)

Section B

- Q3. (a) Describe the typical appearance of *Bacillus cereus* on Gram stain and on the solid medium of your choice. (8 Marks)
- (b) Describe methods used for the laboratory isolation of *B. cereus* from food. (13 Marks)
 - (c) Outline methods used for the prevention of disease caused by *B. cereus*. (6 Marks)
 - (d) Give an account of a disease caused by *B. cereus*. (6 Marks)

Q4. Write a detailed account of verotoxigenic *E. coli*. In your answer include an account of

(a) Reservoirs (5 Marks)

(b) Verotoxin genes and their detection (9 Marks)

(c) The principal methods used to maximize the chance of isolation of this organism.
(10 Marks)

(d) The significance of this organism in human disease (9 Marks)