

**CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ**

Autumn Examinations 2015

Module Title: Analytical Microbiology

Module Code: BIOM 7001

School: Science

Programme Title:

Bachelor of Science in Applied Bioscience & Biotechnology – Year 3

Bachelor of Science (Honours) in Pharmaceutical Biotechnology – Year 3

Bachelor of Science in Analytical & Pharmaceutical Chemistry – Year 3

Bachelor of Science (Honours) in Analytical Chemistry with Quality Assurance – Year 3

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, Ms Richenda Kiernan

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 2015

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.

- (a) There are a number of microbiological considerations in pharmaceutical manufacture. Discuss this statement. (20 Marks)
- (b) List the key personnel required to ensure sterility of the final product. (6 Marks)
- (c) Briefly discuss the principles underlying Good Manufacturing Practice (GMP) (7 Marks)

Q2.

- (a) Discuss the use of cabinets in Cleanrooms. Include in your answer the various types of laminar flow cabinet that might be employed along with the function of each one. (15 Marks)
- (b) Discuss TWO of the following topics:
- (i) Fluid Thioglycollate Medium for the growth of contaminating organisms
 - (ii) Methods used to prevent false positive microbiological results in industry
 - (iii) The BACTEC 9000 instrument for the detection of contaminating organisms (18 marks)

Section B

Q3.

- (a) *Staphylococcus aureus* is a significant pathogen. Discuss the diseases that may be caused by this organism, along with its virulence factors. (15 Marks)
- (b) Indicate, with the aid of a clearly-labelled flowchart, how staphylococci may be distinguished from streptococci, and how *Staphylococcus aureus* may be distinguished from Coagulase Negative Staphylococci, and Micrococci in the laboratory, indicating the laboratory tests that are used in each case. (18 Marks)

Q4.

Escherichia coli may be distinguished using biochemical, serological and molecular methods.

Give an account of the identification of a suspected strain of verotoxigenic *E. coli* after its initial culture following filtration of a water sample, explaining the methods used from each of the three categories listed above. (33 Marks)