

**CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ**

Autumn Examinations 2011

Module Title: Bioanalytical Science I (CA)

Module Code: **BIOL 6003**

School : Biological Science

Programme Title: Bachelor of Science in Applied Sciences – Year 1
 Bachelor of Science in Nutrition and Health – Year 1
 Bachelor of Science in Pharmaceutical Biotechnology – Year 1

Programme Code: **SBIOS_7_Y1**
 SNHSC_8_Y1
 SPHBI_8_Y1

External Examiner(s): Dr. Alison Gallagher, Dr. Anne Nelson, Dr. Jerry Bird

Internal Examiner(s): Ms. R. Kiernan, Dr. M. Sheahan

Instructions: Answer **TWO** questions from each section
 Question 4 is **compulsory**
 Use **separate answer book** for each section

Duration: 2 Hours

Sitting: Autumn 2011

Requirements for this examination:

<p>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.</p>
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Section A

Q1.

Write a **detailed account** on what should be covered in a typical fire safety programme. Include in your discussion the measures that should be in place to prevent fires, immediate reaction when a fire occurs, evacuation procedure(s), types of fire extinguishers available and their suitability to the different types of fires (25 marks)

Q2.

(a) Distinguish between the underwritten pairs of terms. State the units which may be used with each of these terms

(i) Flash Point and Explosive limit? (5 marks)

(ii) TLV-STEL and TLV-C? (5 marks)

(iii) Acute and chronic toxicity? (5 marks)

(b) Write a comprehensive note on the instructions that should be included in handling and disposal procedures for toxic chemicals (10 marks)

(25 Marks)

Q3.

(a) Describe the responsibilities the Safety, Health and Welfare at Work Act (2005) places on employers and employees for the prevention of work-related accidents and ill-health (10 marks)

(b) List the functions of the Health and Safety Authority (5 marks)

What is a *safety statement*? Give a detailed over view of the type of information which may be included in a typical safety statement (10 marks)

(25 Marks)

Section B

Q4. Answer ALL of the following:

- (a) List two safety precautions when working in the biology lab (2 marks)
 - (b) Express 165 microlitres in mls. Which of the following pipettes should be used to deliver this volume: P100, P1000 or P5000? (3 marks)
 - (c) What is a standard solution? Describe the glassware used to prepare the solution. (3 marks)
 - (d) List three methods used to measure the pH of a solution (2 marks)
 - (e) Give three indicators used in acid base titrations (2 marks)
 - (f) Show your calculations for the following: (i) 1% (w/v), 0.05% (v/v) and 0.15% (w/w) (5 marks)
 - (g) When using a spectrophotometer what is the purpose of the blank? (3 marks)
 - (h) What is the difference between accuracy and precision? (5 marks)
- (25 Marks)

Q5. Discuss the unconscious casualty under the following headings:

- (a) Aim
- (b) Signs & Symptoms
- (c) Treatment
- (d) Levels of Responsiveness (25 marks)

Q6.

- (a) Outline the general safety precautions that should be adhered to when working in the laboratory (5 marks)
 - (b) What is a biohazard and draw its symbol (5 marks)
 - (c) List the laboratory facilities required in a Bio-Safety Level 2 Laboratory. (5 marks)
 - (d) Calculate the weight of sodium hydroxide (40g/mol) required to prepare 50cm³ of a 0.02M solution. Express the concentration in N, g/L and % (w/v) (10 marks)
- (25 Marks)