

**CORK INSTITUTE OF TECHNOLOGY  
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ**

**Autumn Examinations 2011**

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| <b>Module Title:      Bioanalytical Science I (CA)</b> |
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**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:**

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| <p><b>Note to Candidates:</b> Please check the Programme Title and the Module Title to ensure that you have received the correct examination paper.<br/>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 50cm<sup>3</sup> of a 0.02M solution. Express the concentration in N, g/L and % (w/v) (10 marks)
- (25 Marks)