

# Cork Institute of Technology

Bachelor of Science in Cell & Molecular Biology – Award

Bachelor of Science in Food Science & Technology – Award

(NFQ – Level 7)

Spring 2006

## **Environmental Science & Industrial Hygiene**

(Time: 2 Hours)

### Instructions

Section A – This Section should be answered by  
both Cell & Molecular Biology students AND  
Food Science & Technology students

Examiners: Dr. I. Siegert  
Prof. R. Fitzgerald

### **PART A:**

Duration: 2 hours (THIS PART SHOULD BE ANSWERED BY BOTH Cell & Molecular Biology students AND Food Science and Technology students).

### **PART B:**

Duration: 1 hour (THIS PART SHOULD BE ANSWERED BY Cell & Molecular Biology students only).

PART A.

Instructions: answer THREE Questions.

All questions carry equal marks.

Q1. Write notes or illustrate or define **EIGHT** only of the following:

- (i) Ionizing Radiation
- (ii) Carcinogens
- (iii) Temperature Inversions
- (iv) Hazard and Risk
- (v) Waste Management Act, 1996
- (vi) Wind-chill Effect
- (vii) Material Safety Data Sheets
- (viii) Sound Intensity
- (ix) Chernobyl Accident (1986)
- (x) Biological Hazards in the Workplace (20 marks)

Q2. (a) Describe the formation of Photochemical Smog and its typical pattern during traffic hours in urban areas. (10 marks)

(b) Discuss (a) the effects and (b) the problems of Acid Rain (8 marks)

(c) Answer ONLY 1) OR 2) of the following: (2 marks)

1. Describe or illustrate how CFCs (Chlorofluorocarbons) chemically decompose stratospheric ozone.
2. Describe the general use of CFCs (Chlorofluorocarbons).

Q3. (a) Describe (i) the psychological and (ii) the physical effects of Noise Pollution. (10 marks)

(b) Discuss the importance of Noise Indicators and Noise Mapping. (4 marks)

(c) List the Major Sources of Noise Pollution and describe **ONE** only in detail. (6 marks)

Q4. (a) Describe in detail (a) Risk Assessment and (b) Risk Management. (10 marks)

(b) Explain the three principles (REC) of Industrial Hygiene. (10 marks)

Q5. (a) Discuss the Waste Hierarchy in Waste Management. (10 marks)

(b) List the principal Waste Management Techniques and describe ONE only in detail. (8 marks)

(c) According to the Waste Management Act (1996) and its National Waste Management Policy Statement “*Changing Our Ways*”, list only FIVE of the EIGHT Targets set by the Act by 2005. (2 marks)

### PART B:

Instructions: answer TWO Questions.

All questions carry equal marks.

Q6. (a) Explain or Illustrate the Dose-Response Relationship in Toxicology. (4 marks)

(b) Explain the importance of the slope of the Dose-Response Relationship Curve. (2 marks)

(c) Briefly describe the Toxicokinetic Stages and outline the aspects that influence the fate of a toxicant in the human body. (4 marks)

Q7. In Ecotoxicology, list the different types of chemical mixtures interactions and describe ONE only in detail. (10 marks)

### OR

Describe the process of BIOMAGNIFICATION and outline the characteristics that a toxicant must have in order to Biomagnify. (10 marks)

Q8. (a) List the main Clean-up Techniques in Contaminated Land Reclamation and describe ONE only in detail. (6 marks)

(b) Name the two main organizations according to which contaminated land Test Methods and Risk Assessment are carried out. (2 marks)

(c) Define Derelict Land. (2 marks)

Q9. (a) List the typical sewage treatment stages and describe ONE only in detail. (8 marks)

(b) According to the Environmental Protection Agency Act, 1992 (Urban Wastewater Treatment Regulations 1995), which are in Ireland, the permissible effluent levels of BOD, SS and COD. (2 marks)