

Cork Institute of Technology

Bachelor of Science in Applied Biosciences and Biotechnology – Award

(NFQ – Level 7)

Spring 2007

Environmental Science and Industrial Hygiene

(Time: 3 Hours)

Instructions

Answer any FIVE questions.

Examiners: Mr. E. Callery

Prof. R.J. Fitzgerald

All questions carry equal marks.

Q1. (a) Describe the term Global Warming and what are it's projected effects?
(10 marks)

(b) Discuss what measures Ireland has taken to combat Global Warming and to meet
it's Kyoto Protocol target?
(4 marks)

(c) Outline the main aims of the Air Quality Framework Directive and how it was
implemented into Irish Law.
(6 marks)

Q2. (a) Discuss the main environmental hazards associated with landfills and outline the
main controls used to minimize their impact.
(12 marks)

(b) List the TWO natural radioactive environmental hazards in Irish soils.
(2 marks)

(c) Discuss **one** of these in detail referring to its origin and how humans can be
exposed to it.
(6 marks)

Q3. (a) Describe in detail TWO methods of secondary treatment.

(12 marks)

(b) Explain the methods of advanced treatment used to remove nitrogen from a waste water.

(5 marks)

(c) List Three EC Directives that protect waters against pollution.

(3 marks)

Q4. Write an informative account of THREE of the following environmental toxins commenting on their sources and toxic effects.

- (i) Pesticides
- (ii) Polychlorinated Biphenols
- (iii) Polynuclear Aromatic Hydrocarbons
- (iv) Mercury
- (v) Lead
- (vi) Cadmium

(20 marks)

Q5. (a) What are the main routes of exposure to a toxic agent?

(4 marks)

(b) Explain the terms (i) Absorption, (ii) Distribution and (iii) Excretion in relation to the toxicokinetics of a toxic agent.

(16 marks)

Q6. (a) How does the body control against heat loss?

(4 marks)

(b) Write a detailed account on the onset of hypothermia detailing (i) its effects on the body, (ii) how wind chill contributes and (iii) what controls should be used to minimize the risk.

(12 marks)

(c) Describe ONE condition brought on by heat stress.

(4 marks)

Q7. (a) Write an informative account on Respiratory Hazardous Substances under the following headings:

- (i) Particulate Matter
- (ii) Hazardous Gases & Vapours
- (iii) Occupational Asthma

(14 marks)

(b) Describe the natural defenses of the respiratory system against exposure to an airborne toxic agent.

(6 marks)

Q8. (a) Define THREE of the following terms in relation to fires.

- (i) Flash Point
- (ii) Oxidising Agent
- (iii) Auto Ignition Temperature
- (iv) Vapour Density

(6 marks)

(b) List the main combustion products of a fire and describe the health hazards associated with each.

(7 marks)

(c) What fire prevention methods should be available in a workplace to minimise the risk of a fire breaking out.

(7 marks)

Q9. (a) Under the provisions of the Safety, Health and Welfare at Work Act, 1989 (updated in 2005) discuss in detail THREE of the following:

- (i) The Duties of the Employer
- (ii) The Duties of the Employee
- (iii) The Duties of Manufacturers & Suppliers
- (iv) The Functions of the Health & Safety Authority

(20 marks)