

**CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ**

Autumn Examinations 2014

Module Title: Environmental Studies (CA)

Module Code: ENVI6001

School: Science

Programme Title(s): BSc (Hons) in Nutrition & Health Science

Programmes Code(s): SNHSC_8_Y2

External Examiner(s): Professor Torres Sweeney

Internal Examiner(s): Mr Ian O Sullivan

Instructions: Question 1 in Section A is Mandatory
Answer any 3 questions from Section B

Duration: 2 Hours

Sitting: Autumn 2014

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. If in doubt please contact an Invigilator.

Section A

Q1 (a) During a laboratory BOD test in a respirometric BOD system it was necessary to prepare three 100ml samples for BOD analysis. (i) Whole Milk (1:500 dilution), (ii) Low Fat milk (1:500 dilution) and (iii) Low Fat milk (1:200 dilution). Explain the dilution method that you applied.

(b) Following the procedure outlined in the 'VELP Scientifica BOD-System Instruction Manual' the BOD of your samples was measured over a period of 5 days and the following results were obtained (Table Q 1). Determine the BOD₅ of both milk types and comment on the values obtained.

Sample	Sample Type	Day	Sample BOD (or error message)
1	Full Fat Milk (1:500)	1	30
		2	138
		3	175
		4	191
		5	207
2	Low Fat Milk (1:200)	1	27
		2	131
		3	185
		4	203
		5	223
3	Low Fat Milk (1:500)	1	UFL
		2	0
		3	17
		4	54
		5	68

Table Q1

- (c) Explain the meaning of any error message encountered.
- (d) Plot the data obtained for the sample BOD's and comment on any trends observed.
- (e) Explain the basic principle of operation of the BOD device and incubator in the laboratory. What is the rationale for adding potassium phosphate etc. to the dilution water mixture? What is the function of the potassium hydroxide reagent?

(5 marks per part = 25 Marks)

Section B

- 2. Discuss each of the following categories of water pollutants and the problems they cause: pathogens, organic wastes, chemical pollutants and sediments.
- 3. Discuss water quality issues in Ireland and suggest methods by which our water problems can be solved into the future.
- 4. In an Irish context, how can we reduce emissions from agriculture, transport and the residential sector without stifling economic growth?
- 5. What mitigation steps could be taken to stabilize the GHG content of the atmosphere?
- 6. What biofuels are used for transportation, and what is the potential for increasing biofuel use?
- 7. What is the potential for developing ocean energy in Ireland?
- 8. What are the security risks and consequences of our growing dependence on foreign oil? How do they relate to the Persian Gulf War of 1991? To terrorism? To the 2003 US-Iraq war?
- 9. Pathways to 2050: Energy and Climate Change. How does this affect us here in Ireland?

(25 Marks Each)