Ollscoil na hÉireann, Gaillimh
National University of Ireland, Galway

GX 1017

Semester 2 Examinations, 2005

Exam Code(s)	3EV1/3EV2
Exam(s)	3rd Year B.Sc. (Environmental Science)
Module Code(s)	MI319
Module(s)	Environmental Microbiology II
Paper No.	1
Repeat Paper	
External Examiner(s)	Dr. Peter D. Moore
Internal Examiner(s)	Professor E. Colleran

Instructions: **Answer THREE Questions**

Please indicate clearly the numbers of the questions answered on the first page of your Answer Book

Duration	2 hrs
No. of Answer books	

Requirements:

Handout	
MCQ	
Statistical Tables	
Graph Paper	
Log Graph Paper	
Other Material	
No. of Pages	
Department(s)	Microbiology

Q.1 Compare and contrast the light phase of oxygenic and anoxygenic microbial photosynthesis. In your answer, focus solely on photolithotrophic microorganisms (exclude photoorganotrophic species) (20 marks)

Q.2 Critically discuss the phenomenon of chemolithotrophy in the microbial Kingdom – i.e. how do microbes gain energy, reducing power and carbon for growth and reproduction from inorganic compounds? (20 marks)

Q.3 (i) Describe the ideal characteristics of an "indicator organism" of human or animal faecal contamination of natural waterbodies and potable and recreational waters (8 marks).

(ii) Discuss how *E. coli* satisfies the requirements of an indicator of faecal contamination (12 marks).

Q.4 Discuss the role of microbes in the carbon cycle, focussing particularly on their role in the decomposition of natural and xenobiotic organic compounds (20 marks).

Q.5 (i) Distinguish between nitrogen fixation, nitrification and denitrification in the global nitrogen cycle (8 marks).

(ii) Comment specifically on the involvement of microbes in nitrification/ denitrification processes (12 marks).

Q.6 Describe, giving examples, the variety of mutualistic associations that occur between microbes and other microbes, plants and animals (20 marks)

OR

Describe, giving examples, the variety of antagonistic examples that occur between microbes and other microbes, plants and animals (20 marks)

Q.7 Discuss the relevance of the eco-atmosophere as a habitat for microorganisms (20 marks)

OR

Write an essay on the microbial ecology of marine ecosystems