



## **Semester I Examinations 2008 / 2009**

<b>Exam Code(s)</b>	3BS9
<b>Exam(s)</b>	3rd Year Science Examination
<b>Module Code(s)</b>	MI316
<b>Module(s)</b>	Industrial and Environmental Microbiology
<b>Paper No.</b>	1
<b>External Examiner(s)</b>	Professor Geoffrey McMullan
<b>Internal Examiner(s)</b>	Professor Vincent O'Flaherty Dr. Thomas Barry

### ***Instructions***

### **Answer 5 Questions**

**Please indicate clearly the numbers of the questions answered on the first page of your answer book**

### ***Duration***

	3 Hours
<b>No. of Pages</b>	1
<b>Department(s)</b>	Microbiology
<b>Requirements</b>	None

- Q1.** Write an essay on “The microbiology of brewing”.
- Q2.** Using at least two specific examples explain how microorganisms can cause food-intoxications.
- Q3.** Discuss the use of fed-batch and continuous bioprocesses in industrial situations. What are their advantages and disadvantages when compared with batch processes.
- Q4.** The following pairs represent alternative methods for sterilization on an industrial scale. For **two** of these pairs: a) discuss the purpose for which they are used b) define, compare and contrast the two items.
1. In-place batch heat sterilization/ the use of continuous heat sterilisers
  2. Depth filters/Absolute filters
  3. Radiation sterilisation /Gas (ethylene oxide) sterilisation
- Q5.** Write an essay on “The epidemiology of an infectious disease”.
- Q6.** Write an essay on “Deaths resulting from hospital acquired (nosocomial) infections”.
- Q7.** List the characteristics of an ideal indicator microorganism for sewage pollution of water. Describe the methodologies used to detect, enumerate and confirm the presence of *Escherichia coli* in water bodies.
- Q8.** Briefly describe the impact of microbial biofilms on the biosphere. Outline the steps in bacterial biofilm formation, using appropriate experimental examples to illustrate your answer.



## Semester II Examinations 2008/2009

Exam Code(s)	3BS9
Exam(s)	3rd Year Science Examination
Module Code(s)	MI317
Module(s)	Molecular and Cellular Microbiology
Paper No.	1
Repeat Paper	Special Paper
External Examiner(s)	Professor G. McMullan
Internal Examiner(s)	Professor V. O'Flaherty Dr. T. Barry

**Instructions:** **Answer 5 Questions**

**Please indicate clearly the numbers of the questions answered on the first page of your answer book**

Duration	3 Hours
No. of Pages	Cover Page + 1
Department(s)	Microbiology
Course Co-ordinator(s)	Dr. Thomas Barry (Ext. 3189)





## AUTUMN EXAMINATION 2008/2009

**Exam Code(s)**                    **3BS9**

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**Exam(s)**                            **3rd Year Science Examination**

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**Module Code(s)**                **MI316**

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**Module(s)**                        **Industrial and Environmental Microbiology**

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**Paper No.**                         **1**

**Repeat Paper**                    **Special Paper**

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**External Examiner(s)**        **Professor G. McMullan**

**Internal Examiner(s)**        **Professor V. O'Flaherty**

**Dr. T. Barry**

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**Instructions:**                    **Answer 5 Questions**

**Please indicate clearly the numbers of the questions answered on the first page of your answer book**

**Duration**                            **3 Hours**

**No. of Pages**                      **Cover Page + 1**

**Department(s)**                  **Microbiology**

**Course co-ordinator**            **Dr. Thomas Barry (Ext. 3189)**

1. Describe the process of Eutrophication of lakes. How does the presence of excess Nitrogen and Phosphorous contribute to the Eutrophication process
2. Compare and contrast the use of crude and defined media for industrial bioprocesses
3. When heat sterilising thermolabile liquids (media, for example) which do you think is preferable (and why):
  - a) A higher temperature and a shorter time.
  - b) A lower temperature and a longer time.

What are the problems in applying the treatment you have chosen and how might they be overcome.?

4. Write a short essay entitled “The microbiology of cheese production”.
5. Food-borne intoxications can be caused either by bacteria or fungi. Discuss this statement with reference to one bacterial agent and one fungal agent.
6. Describe the current model for the formation of a bacterial biofilm, using experimental examples to illustrate your answer. In your answer, briefly indicate the significance of biofilms in relation to human health.
7. Write an essay on “The epidemiology of an infectious disease of your choice”.
8. Write an essay on “Some of the strategies available for controlling infectious diseases in populations”.



## Autumn Examination 2008/2009

Exam Code(s)	3BS9
Exam(s)	3rd Year Science Examination
Module Code(s)	MI317
Module(s)	Molecular and Cellular Microbiology
Paper No.	1
Repeat Paper	Special Paper
External Examiner(s)	Professor G. McMullan
Internal Examiner(s)	Professor V. O'Flaherty Dr. T. Barry

**Instructions:**                    **Answer 5 Questions**

**Please indicate clearly the numbers of the questions answered on the first page of your answer book**

Duration	3 Hours
No. of Pages	Cover Page + 1
Department(s)	Microbiology
Course Co-ordinator(s)	Dr. Thomas Barry (Ext. 3189)

1. Write an essay entitled 'Antigens and Antibodies – Structure and Properties'. Include in your answer a description of each of the five immunoglobulin classes.
2. Write an essay entitled 'Hypersensitivity – the immune system in chaos.'
3. Write an essay entitled 'The mechanisms of Gene Regulation in Bacteria'.
4. Describe how the processes of translocation, amplification and point mutation can cause activation of Proto-Oncogenes and explain the consequences of this activation in normal cells.
5. Compare and contrast the pathways of fatty acid anabolism and catabolism in yeast and bacteria.
6. Outline the mechanisms which allow (i) aerobes and (ii) anaerobes, such as *Clostridia spp.*, to derive energy and reducing power from amino acids as a sole carbon source.
7. Outline the main requirements for activity of **each** of the following nucleic acid modifying enzymes:
  - (a) DNA polymerases
  - (b) restriction endonucleases
  - (c) DNA ligases.
8. Outline the main steps involved in making a cDNA library from eucaryotic cells. Explain the main advantages of cDNA over genomic DNA libraries.