

**CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ**

Semester 1 Examinations 2008/09

Module Title: Introductory Microbiology

Module Code: BIOM 6008

School: Science

Programme Title: Bachelor of Science (Honours) in Herbal Science – Stage 2

Programme Code: SHERB_8_Y2

External Examiner(s): Prof. E. Williamson, Dr. D. Clare
Internal Examiner(s): Ms. R. Kiernan

Instructions: Answer 4 Questions

Duration: 2 Hours

Sitting: Winter 2008

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 paper.
If in doubt please contact an Invigilator.

- Q1. (a) With the aid of a diagram show the structural arrangements of the prokaryotic cell. (5 Marks)
- (b) Name three structures found in both prokaryotic and eukaryotic cells and discuss their functions. (12 Marks)
- (c) Outline the principle of the gram stain and give one example of a gram positive and a gram negative bacterium. (8 Marks)
- Q2. (a) Write an account of how organisms are categorised based on their response to pH, temperature, oxygen concentration and water activity on their environment. In your answer, mention how these variables are controlled in the laboratory to achieve optimum growth rates. (20 Marks)
- (b) What are the advantages of using a complex medium for growth? Give an example of such a medium. (5 Marks)
- Q3. (a) Describe the various forms of heat treatment used in the control of microbial populations. (13 Marks)
- (b) Write explanatory notes on the use of the following for reducing or removing microorganisms from the environment:
- (i) Filtration
 - (ii) UV radiation
 - (iii) Alcohol
 - (iv) Chlorine
- (12 Marks)

Q4. (a) Explain the ways in which

- (i) cell numbers
- (ii) cell mass

Can be used to monitor the presence or growth of microorganisms. (10 Marks)

(b) Describe how you would perform a viable plate count in the laboratory. (5 Marks)

(c) Draw a typical growth curve for a bacterial population in a batch culture and describe the various phases of growth. (10 Marks)

Q5. (a) Write an account of the general properties of the following:

- (i) Viruses
- (ii) Bacteria
- (iii) Fungi

(15 Marks)

(b) Outline how viruses are cultivated and measured in the laboratory. (5 Marks)

(c) Outline the mechanics by which bacteriophage infect their host cell. (5 Marks)

Q6. List and discuss the properties used in classification and identification of bacteria. In your answer, indicate which methods you consider most important in routine identification of organisms. (25 Marks)