

**CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ**

Autumn Examinations 2013/2014

Module Title: Introduction to Biotechnology CA

Module Code: **BIOT6001**

School: Science

Programme Title: BSc in Applied Biosciences& Biotechnology
 BSc Hons Pharmaceutical Biotechnology
 BSc Hons in Nutrition and Health science
 BSc Analytical & Pharmaceutical Chemistry
 BSc Hons in Analytical Chemistry

Programme Code: **SCHQA_8_ Y1**
 SCHEM_7_ Y1
 SBIOS_7_ Y1
 SPBHI_8_ Y1
 SNHSC_8_ Y1

External Examiner(s): **Dr Cormac Gahan**

Internal Examiner(s): **Dr Helen O Shea**
 Ms Margaret Lane

Instructions: **Answer 4 Questions.**
 Question 1 is compulsory.

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 paper.
If in doubt please contact an Invigilator.

Question 1 is compulsory

Q1

(a) Describe the procedure you would use in a laboratory to prepare a stock of an *E coli* culture for low temperature storage. (10 marks)

(b) The following media were inoculated with an *E coli* culture to determine which media would allow the best growth of the culture.

(i) Nutrient medium pH 7

(ii) Nutrient medium pH 4

(iii) Nutrient medium pH 7 with 1% glucose added

Explain how you would determine the growth of the *E coli* in this experiment. (5 marks)

Explain which media you would expect would provide the best growth and state why this would be the best media. (3 marks)

What temperature would you recommend for the incubation of the media with the *E coli*

(1 marks)

(c) Express each of the following volumes (in mls) as μl 's and state which micropipette would be the most suitable to deliver this volume.

0.6 ml

0.03ml

1.0ml

(6 marks)

Q2.

(a) What is Biotechnology? (5 marks)

(b) List and briefly discuss any 5 scientific events that were significant in the development of biotechnology. (20 marks)

Q3

Write a brief description of each of the following terms and explain their importance in biotechnology.

Isolation of DNA from cells (8 marks)

Restriction Enzymes (8 marks)

Vectors (3 marks)

PCR (3 marks)

Probe (3 marks)

Q4

Bacterial cells are often used in biotechnology to produce products.

- (a) Name two other cell types that are used in biotechnology. (2 marks)
- (b) List 5 reasons why bacterial cells are used in biotechnology (5 marks)
- (c) Draw and label a typical bioreactor used in biotechnology (12 marks)
- (d) List the main parameters that must be controlled when growing cells in a bioreactor. (6 marks)

Q5

Write an account of the role of DNA in each of the following

- (a) Biotechnology
- (b) Food safety
- (c) Medicine
- (d) Crime investigation (25 marks)

Q6

Write an account of antibodies using the following headings

- (a) Function of antibodies (4 marks)
- (b) Structure of antibodies (10 marks)
- (c) Monoclonal antibodies (5 marks)
- (d) Applications of monoclonal antibodies (6 marks)