

**CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ**

Semester 3 Examinations 2007/08

Module Title: Introduction to Biotechnology (CA)

Module Code: BIOT 6001

School: Science

Programme Title: Bachelor of Science in Applied Biosciences – Year 1

Programme Code: SBIOS_7_Y1

External Examiner(s): Prof. Gary Walsh

Internal Examiner(s): Dr. Jim O'Mahony, Mr. Eoghan Callery

Instructions: Answer 2 questions from Section A and 2 questions from Section B.

All questions carry equal marks.

Use a separate answer book for each Section.

Duration: 2 hours

Sitting: Autumn 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.

SECTION A (ANSWER 2 QUESTIONS ONLY)

- Q1. Write an essay on the types of cells that are used in the Biotechnology industry.
In your answer make reference to how you would optimise the growth of these cells.
(25 marks)
- Q2. “DNA and protein are the most important components of a biological cell”.
From a biotechnology perspective discuss whether you agree with this statement.
(25 marks)
- Q3. Outline in detail the types of products which are made in the modern day biotechnology plant. Use specific examples to illustrate your answer.
(25 marks)

SECTION B (ANSWER 2 QUESTIONS ONLY)

- Q4. (a) Describe how you would
(i) Prepare an isolated cell culture for stocking to ensure a viable culture will be stored for future use.
(ii) Recover a stocked culture.
(15 marks)
- (b) Define the terms Selective Media and Differential Media. Explain how you would use each media to isolate a particular species of bacteria.
(10 marks)
- Q5. (a) Using a spectrophotometer to measure the quantity and quality of an isolated DNA sample (diluted 1:100) the following results were obtained:
- | | |
|----------------------|-------|
| Absorbance at 260nm: | 0.150 |
| Absorbance at 280nm: | 0.081 |
- (i) Calculate the concentration of the isolated DNA sample in µg/ml using the following formula:
Absorbance at 260nm X Dilution Factor X 50
(8 marks)
- (ii) Estimate if the DNA sample is pure or if it contains RNA or proteins.
(8 marks)
- (b) For the analysis of DNA by electrophoresis what is the function of:
(i) The ethidium bromide.
(ii) The TAE buffer.
(iii) The marker dye.
(9 marks)

Q6. (a) You are given the task of identifying three different cell samples on pre-prepared slides using a microscope. You are told that one slide is of animal cells, one is of plant cells and one is of bacteria cells but you do not know which is which. How would you identify and distinguish between each cell type?

(15marks)

(b) In an experiment to determine the lactic acid produced by different inoculated cultures in skimmed milk, a blank of skimmed milk with no culture added was found to have a lactic acid content of 0.25%.

(i) Why would there be lactic acid in the blank?

(5 marks)

(ii) Why is the blank used in the experiment?

(5 marks)