

**CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ**

Autumn Examinations 2012/13

Module Title: Applied Biotechnology - CA

Module Code: BIOT7001

School: Science

Programme Title: BSc in Pharmaceutical Biotechnology
BSc in Applied Biosciences with Biotechnology

Programme Code: SPHBI_8_Y3
SBIBI_7_Y3

External Examiner(s): Dr. Gillian Gardiner
Internal Examiner(s): Dr. Rosemary Rea, Dr. Jim O'Mahony

Instructions: Answer question 1 and 2 other questions. All questions carry equal marks.

Duration: Time = 2 hours

Sitting: Autumn 2013

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.** Provide an overview of a laboratory based strategy for identification of a novel anti-microbial producing strain. Include the following:
- Screening strategy for novel anti-microbial producing strain **(14 marks)**
 - Preliminary assessment of putative anti-microbial **(14 marks)**
 - Cloning a peptide based anti-microbial into an *E. coli* expression host **(22 marks)**
- Q2.** Discuss the drug discovery and development process using the following headings:
- Choosing a disease **(6 marks)**
 - Choosing a drug target **(5 marks)**
 - Find a lead compound **(20 marks)**
 - Optimisation of lead compound **(9 marks)**
 - Clinical trials **(10 marks)**
- Q3.** (a) Describe the use of the DHFR (Dihydrofolate Reductase) expression system for production of human proteins by Chinese Hamster Ovary cells in vitro **(34 marks)**.
- (b) Describe using a flow diagram the production of a DNA vaccine and list any potential advantages of this type of vaccine **(16 marks)**.
- Q4.** (a) Define protein engineering and describe its effect on the insulin hormone using Lispro and Glargine as examples **(20 marks)**.
- (b) List the production issues facing the agricultural sector and the potential benefits of using modern biotechnology in agriculture **(10 marks)**.
- (c) Describe the production of Bt corn and list the advantages and disadvantages associated with it **(20 marks)**.