

**CORK INSTITUTE OF TECHNOLOGY**  
**INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ**

**Autumn Examinations 2012/2013**

**Module Title: Biomanufacturing Science**

**Module Code:** BIOL8012

**School:** Science and Informatics

**Programme Title:** BSc in Nutrition and Health Science  
BSc in Herbal Science

**Programme Code:** SNHSC\_8\_Y4  
SHERB\_8\_Y4

**Internal Examiner:** Dr. Máire Begley

**External Examiners:** Prof. Torres Sweeney  
Prof. Julia Green

**Instructions:** Answer **Q1** and **two** other questions.

Q1 is worth 40 marks. All other questions carry equal marks (30 marks).

**Duration:** 2 hours

**Sitting:** Autumn 2013

**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. COMPULSORY QUESTION**

Write short notes on **four** of the following:

- (a) Pulsed electric field processing.
- (b) Potential applications of bacteriocins in the food and pharma industries.
- (c) Stability studies on pharmaceuticals.
- (d) Intelligent packaging.
- (e) The benefits and controversies of genetically modified products.
- (f) Applications of transgenic plants in biopharming.

**(4 x 10 marks)**

## **Q2.**

- (a) Explain what retention factors are. **(5 marks)**
- (b) Explain what antinutrients are and give examples. **(5 marks)**
- (c) Describe the effects of extrusion on four different food nutrients. **(8 marks)**
- (d) Explain what high pressure processing (HPP) is and list three advantages and three disadvantages of this method. **(12 marks)**

## **Q3.**

- (a) Describe three specific applications of genetically modified plants in agriculture. **(12 marks)**
- (b) Explain why plant cell bioreactors provide attractive features over traditional expression systems that utilize microbial and mammalian host cells. **(8 marks)**
- (c) Outline methods available for the detection of genetically modified organisms (GMOs). **(10 marks)**

**Q4.**

- (a) Explain what E numbers are and list the three criteria that a food additive must meet for it to be authorised. **(7 marks)**
- (b) Explain what excipients are and outline the reasons that they are used in the pharmaceutical industry. **(9 marks)**
- (c) Explain what sensory evaluation is and list four uses of sensory evaluation in industry. **(9 marks)**
- (d) List seven purposes of packaging and package labels. **(5 marks)**