CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ

Semester 1 Examinations 2013

Module Title: Cellular Biotechnology

Module Code: **BIOT6006**

School: Science

Programme Title: Bachelor of Science (Honours) in Pharmaceutical Biotechnology – Year 2
Bachelor of Science (Honours) in Nutrition and Health Science – Year 2

Programme Code: **SPHBI_8_Y2**
SNHSC_8_Y2

External Examiner(s): **Dr Cormac Gahan**
Internal Examiner(s): **Dr Rosemary Rea**

Instructions: Answer **any 3** questions below. All questions carry equal marks.

Duration: 2 Hours

Sitting: Winter 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. Discuss mammalian cell culture growth medium using the following headings:

- types of artificial animal cell culture media **(8 marks)**
- individual components of the defined portion of serum containing cell culture medium and the function of each **(16 marks)**
- advantages, disadvantages and source of serum **(10 marks)**
- media sterilisation **(16 marks)**

Q2. **(A)** Discuss nutrient uptake by the cell. In your answer compare the methods by which cells acquire nutrients. **(26 marks)**

(B) Discuss the role of restriction enzymes in joining together two pieces of DNA. **(15 marks)**

(C) Define cell culture and list five reasons why cells are grown in vitro. **(9 marks)**

Q3. **(A)** List three cell culture expression systems and outline the advantages and disadvantages of each. **(20 marks)**

(B) Discuss the environmental parameters outlined below and describe how these parameters are controlled / monitored during mammalian and microbial cell growth: **(30 marks)**

- temperature
- pH
- oxygen

Q4. Discuss the following:

- monitoring mammalian cell growth using a Neubauer haemocytometer **(15 marks)**
- common mammalian cell culture contaminants **(20 marks)**
- environmental monitoring of clean rooms **(15 marks)**