

**CORK INSTITUTE OF TECHNOLOGY  
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ**

**Autumn Examinations 2012/13**

**Module Title: Cellular Biotechnology**

**Module Code:** BIOT6006

**School:** Science

**Programme Title: Degree in Pharmaceutical Biotechnology  
Degree in Nutrition and Health Science**

**Programme Code:** CR\_SPHBI\_8\_Y2  
CR\_SNHSC\_8\_Y2

**External Examiner(s): Dr. Jerry Bird  
Internal Examiner(s): Dr. Rosemary Rea**

**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 the methods used to grow and maintain mammalian cells in vitro using the following headings:
- Growth media preparation **(10 marks)**
  - Aseptic requirements **(10 marks)**
  - Sub-culturing anchorage dependent and suspension cells **(10 marks)**
  - Incubation requirements **(6 marks)**
  - Direct method of cell counting **(14 marks)**
- Q2.** (a) Describe the techniques used for monitoring bacterial growth **(20 marks)**.
- (b) Discuss the use of cleanrooms in a biopharmaceutical facility **(30 marks)**.
- Q3.** (a) Discuss environmental parameters that affect the growth of microbial cells and how these parameters are controlled / monitored **(38 marks)**.
- (b) Compare the advantages and disadvantages of using *E. coli* and a yeast expression system **(12 marks)**.
- Q4.** Discuss the following:
- Environmental monitoring of cleanrooms **(18 marks)**
  - Methods utilised by cells for nutrient uptake **(18 marks)**
  - *Mycoplasma* as a mammalian cell culture threat **(14 marks)**