

CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ

Semester 1 Examinations 2012

Module Title: Cellular Biotechnology

Module Code: BIOT6006

School: Science & Informatics

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 Jerry Bird
Internal Examiner(s): Dr Rosemary Rea

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

Duration: 2 Hours

Sitting: Semester 1 2012

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.** Biological processes require the accurate determination of cell growth. Describe the techniques used for monitoring growth of bacterial and mammalian cells. **(30 marks)**
- Q2.** Describe the process of growing and maintaining mammalian cells *in vitro*. Make reference to:
- Growth vessels **(4 marks)**
 - Preparation and sterilisation of cell culture medium **(8 marks)**
 - Provision of optimum growth conditions **(4 marks)**
 - Cell culture procedure for anchorage dependent cells **(5 marks)**
 - Common cell culture contaminants **(9 marks)**
- Q3.** (A) Describe the phases of mammalian cell growth. **(8 marks)**
- (B) Describe the nutritional categories of cells based on carbon and energy sources. Discuss nutrient uptake by the cell. **(14 marks)**
- (C) Compare the advantages and disadvantages of using *E. coli* and mammalian eukaryotic expression systems. **(8 marks)**
- Q4.** Discuss the role of restriction enzymes, plasmid DNA vectors and PCR in creating recombinant DNA. **(30 marks)**
- Q5.** Discuss reducing the risk of contamination in a biopharmaceutical setting using the following headings:
- Contamination Control through Aseptic technique **(10 marks)**
 - Clean Rooms **(10 marks)**
 - Environmental monitoring **(10 marks)**