

**UNIVERSITY OF JAFFNA**  
**BACHELOR OF PHARMACY**  
**FOURTH YEAR FIRST SEMESTER EXAMINATION (Old Syllabus) – July 2013**  
**PHABT4103 PHARMACEUTICAL BIOTECHNOLOGY**

**Date: 11/11/2013**

**Time: 2 Hours**

**PART II**

Answer all the Questions.

1. 1.1 Describe both advantages and disadvantages of batch and continuous culture. (60 Marks)  
1.2 1.2.1 Draw a graph of biomass concentration against time for the batch culture. (20 Marks)  
1.2.2 Identify four phases in that graph. (20 Marks)
2. Describe the production of following by fermentation.  
2.1 Penicillin. (50 Marks)  
2.2 Sterptomycine. (50 Marks)
3. 3.1 What is DNA recombinant technology? (20 Marks)  
3.2 List five pharmaceutical applications of DNA recombinant technology. (30 Marks)  
3.3 Briefly explain the recombinant insulin production process. (50 Marks)
4. 4.1 Write an account on ELISA technique. (50 Marks)  
4.2 Describe the Northern Blot technique. (50 Marks)
5. 5.1 Explain the term attenuation in vaccine production. (20 Marks)  
5.2 List five live attenuated vaccines. (20 Marks)  
5.3 How will you produce antiserum from animals? (60 Marks)
6. 6.1 Mention the different types of insulin. (20 Marks)  
6.2 What is insulin Analog and explain with example. (30 Marks)  
6.3 Briefly explain the monoclonal antibody production, using biotechnology. (50 Marks)
7. 7.1 Write an account on good laboratory practice (100 Marks)
8. 8.1 Describe the PCR method. (100 Marks)