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**UNIVERSITY OF JAFFNA**  
**BACHELOR OF PHARMACY**  
**FOURTH YEAR FIRST SEMESTER EXAMINATION**  
**PHABT4103 PHARMACEUTICAL BIOTECHNOLOGY**

Date: 17/02/2017

Time: 2 Hours

**PART II**

**Answer all 6 questions.**

1.
  - 1.1 Define the term “electrophoresis”. (20 Marks)
  - 1.2 Give the principle of electrophoresis and explain the factors which affect the migration of protein molecules during electrophoretic separation. (60 Marks)
  - 1.3 Describe the factors that affect the migration of DNA in agrose gel electrophoresis. (20 Marks)
  
2.
  - 2.1 Define the term fermentation. (10 Marks)
  - 2.2 Explain how penicillin is produced by chemical and fermentation processes. (70 Marks)
  - 2.3 Describe the downstream processes of the penicillin produced from the fermented broth. (20 Marks)
  
3.
  - 3.1 What are the common properties of vectors in genetic engineering. (20 Marks)
  - 3.2 Describe four (04) cloning vectors that are used to produce proteins and in which way the vectors are differ from each other and useful. (80 Marks)
  
4.
  - 4.1 List the different methods used to prepare cell lysate (25 Marks)
  - 4.2 Describe one of the above mentioned method used to prepare cell lysate from animal cell culture. (45 Marks)
  - 4.3 Explain, how the organelles in the cell lysate can be separated (30 Marks)

5.

- 5.1 What is papain and how does it act? (25 Marks)
- 5.2 Describe the process to prepare concentrated papain from papaya latex. (40 Marks)
- 5.3 Give the industrial applications of papain with explanations. (35 Marks)

6.

- 6.1 Briefly describe the restriction enzyme. (30 Marks)
- 6.2 Explain how a needed gene from a DNA can be amplified. Explain the technique with the essential chemicals/biochemicals. (70 Marks)