UNIVERSITY OF JAFFNA, SRI LANKA
FACULTY OF ALLIED HEALTH SCIENCES
FOURTH YEAR FIRST SEMESTER EXAMINATION IN BPharmHons - 2023
PHAMB 4143 MOLECULAR BIOLOGY AND PHARMACEUTICAL BIOTECHNOLOGY

Date: 10 DEC 2024 **Time: 03 Hours**

Answer all six questions.
Answer part A, part B and part C in separate answer books.

PART A

1. **1.1** Briefly describe the following steps in the ethanol production by yeast fermentation.

   1.1.1 Upstream process. **(20 Marks)**

   1.1.2 Fermentation **(20 Marks)**

   1.1.3 Downstream process **(20 Marks)**

   1.2 **1.2.1** State two (02) methods used for microbial strain improvement in fermentation. **(10 Marks)**

   1.2.2 Explain the methods mentioned in **1.2.1.** **(30 Marks)**

2. **2.1** Describe the structure of insulin. **(15 Marks)**

   2.2 Explain the production of insulin using DNA recombinant technology. **(45 Marks)**

   2.3 Briefly explain how the following insulin analogues act as depot preparations.

   2.3.1 Insulin Glargine **(20 Marks)**

   2.3.2 Insulin Determir **(20 Marks)**

PART B

3. **3.1** List the different types of ELISA assays. **(10 Marks)**

   3.2 Briefly discuss the advantages of different types mentioned in **3.1.** **(40 Marks)**

   3.3 List the applications of

   3.3.1 Southern blotting. **(10 Marks)**

   3.3.2 northern blotting. **(10 Marks)**

   3.2.3 western blotting. **(10 Marks)**

   3.4 Briefly discuss the principle behind DNA microarray. **(20 Marks)**

4. 4.1 Briefly explain the benefits of pharmacogenetics. **(20 Marks)**

4.2 Briefly discuss the challenges in gene therapy. **(45 Marks)**

4.3 Briefly discuss the principal behind the gel electrophoresis. **(35 Marks)**

PART C

5. 5.1 Define the followings,

5.1.1 Missense mutation **(10 Marks)**

5.1.2 Silent mutation **(10 Marks)**

5.1.3 Nonsense mutation **(10 Marks)**

5.2 Briefly describe the role of Telomeres in DNA replication. **(25 Marks)**

5.3 Describe the post-transcriptional modification that takes place in eukaryotes. **(45 Marks)**

6. 6.1 List essential components of a Polymerase Chain Reaction (PCR) master mixture and their functions. **(20 Marks)**

6.2 Briefly explain the important steps involved in a PCR reaction. **(30 Marks)**

6.3 Explain how Real-time PCR differs from conventional PCR. **(20 Marks)**

6.4 Write a note on "Principle and applications of Fluorescence in Situ Hybridization". **(30 Marks)**