



UNIVERSITY OF RUHUNA – FACULTY OF ALLIED HEALTH SCIENCES
DEPARTMENT OF PHARMACY
THIRD BPHARM PART II EXAMINATION - DECEMBER 2021
PH 3233 PHARMACEUTICAL BIOTECHNOLOGY – SEQ

(5)

Index No:.....

TIME: TWO HOURS

INSTRUCTIONS

- There are **four** questions in part **A** and **B** in this SEQ paper.
- Answer all questions.
- No paper should be removed from the examination hall.
- Do not use any correction fluid.
- Use illustrations where necessary.

PART A

1. DNA extraction is a key step in recombinant DNA technology.
1.1 List the different steps involved in plasmid DNA extraction. (20 marks)
1.2 State the importance of each step mentioned in 1.1. (20 marks)
1.3 State two differences between genomic DNA extraction and plasmid DNA extraction techniques. (10 marks)
1.4 Restriction endonucleases are a group of enzymes found in living organisms.
1.4.1 Write an account on restriction endonucleases. (20 marks)
1.4.2 List four properties of restriction endonucleases. (20 marks)
1.4.3 Name two restriction endonucleases and state their sources. (10 marks)

2.
2.1 What is downstream processing? (15 marks)
2.2 List the steps of production of sterile water. (15 marks)
2.3 List five different chromatographic methods and state the basis of protein separation. (20 marks)
2.4 Briefly describe the chromatofocusing technique. (25 marks)
2.5 Briefly describe the final product formulation. (25 marks)

PART B

3. "Fermentation is an enzyme catalyzed, metabolic process whereby organisms convert substrate into valuable products through aerobic and anaerobic routes".
3.1 List five different types of bioreactors used in the fermentation processes. (10 marks)
3.2 Briefly describe one bioreactor type you mentioned in the 3.1. (15 marks)
3.3 Discuss the essential features of a typical bioreactor considering its general function. (25 marks)
3.4 Describe the production process of citric acid through fermentation. (30 marks)
3.5 Briefly explain the steps of the microbial enzyme production. (20 marks)
4. "Cell culture is a process of removing cells from the organism and introducing them into an artificial environment with favorable conditions for growth".
4.1 List four examples of culture media used in cell culture. (10 marks)
4.2 State five applications of cell cultures. (20 marks)
4.3 What are the differences between primary cultures and secondary cultures? (15 marks)
4.4 Discuss how the stem cells could be used to treat or prevent a disease. (30 marks)
4.5 What are edible vaccines? (10 marks)
4.6 State five advantages of edible vaccines. (15 marks)

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