



UNIVERSITY OF RUHUNA – FACULTY OF ALLIED HEALTH SCIENCES

DEPARTMENT OF PHARMACY

THIRD BPHARM PART I EXAMINATION - JANUARY 2023

PH 3125 PHARMACOGNOSY II – SEQ PAPER

TIME: THREE HOURS

INSTRUCTIONS

- There are **six** questions in part **A, B, C, D, E** and **F** 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.

Assume that your research group has isolated **10 mg** of two novel chemical compounds **Runicloside A** and **Runicloside B** from a very rare medicinal plant. Preliminary studies revealed that **Runicloside A** and **Runicloside B** possess potent antibacterial activity against several pathogenic bacterial strains as well as moderate anticancer activity as shown in the following **Table 1** and **Table 2**.

Table 1. MIC* of Runicloside A and Runicloside B

Bacterial strain	Runicloside A (nM)	Runicloside B (nM)	Tetracycline (Positive control) (nM)
<i>Staphylococcus aureus</i>	0.20	0.05	0.15
<i>Pseudomonas aeruginosa</i>	0.10	0.02	0.01
<i>Bacillus cereus</i>	0.10	0.10	0.25
<i>Escherichia coli</i>	0.75	0.20	0.20

*MIC-Minimum Inhibitory Concentration

Table 2. CC₅₀* of Runicloside A and Runicloside B

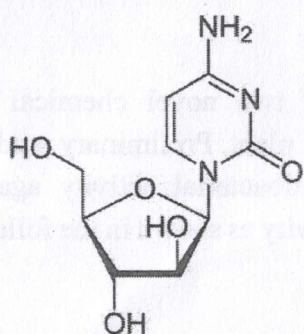
Cell line	Runicloside A (nM)	Runicloside B (nM)	Doxorubicin (Positive control) (nM)
Hepatocellular carcinoma	0.020	>300	0.05
Lung carcinoma	0.005	>300	0.02
Ovarian adenocarcinoma	0.003	125	0.10
Normal human cell line	0.001	>300	75

*CC-Cytotoxic concentration

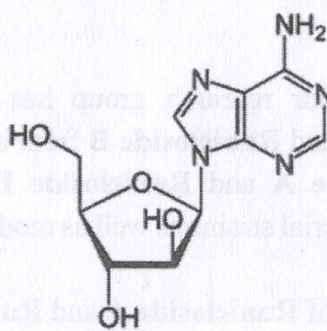
- 1.1 Your research group aims to develop an antibacterial drug. Giving reasons, state whether you are going to choose **Runicloside A** or **Runicloside B** for the development of antibacterial drug. (25 marks)
- 1.2 As you think, what are the problems that you would face when you subject the selected drug candidate in 1.1 to animal studies or clinical trials? How would you overcome these problems? (20 marks)
- 1.3 List the expected characteristics of a new drug. (15 marks)
- 1.4 Before conducting a clinical trial, it is always advised to conduct animal studies. Briefly explain the importance of animal studies in drug development. (40 marks)

2.

- 2.1 State **five** important things to be documented when you are collecting a marine organism for isolation of secondary metabolites. (15 marks)
- 2.2 Identify the following drugs **A** and **B**. Give **one** therapeutic use of each drug. (20 marks)



A



B

- 2.3 List **six** types of enzymes according to the enzyme commission (EC). (15 marks)
- 2.4 Briefly explain the therapeutic uses of enzymes giving examples for each. (50 marks)

PART B

3.

- 3.1 Briefly describe applications of following culture types;
 - 3.1.1 Seed culture
 - 3.1.2 Embryo culture
 - 3.1.3 Ovule culture and another culture (60 marks)
- 3.2 Describe the important steps in plant tissue culture for obtaining a plant. (40 marks)

PART C

4.

- 4.1 Briefly explain the term “substitute” and “adulterants” of herbal drugs. (20 marks)
- 4.2 Write the different ways of “drug adulteration”. (20 marks)
- 4.3 Explain the methods used for standardization and quality control of crude drugs in Ayurveda medicine. (30 marks)
- 4.4 Describe the associated problems of herbal/Ayurveda medicine in Sri Lanka. (20 marks)
- 4.5 Write the essential contents of individual herbal monograph. (10 marks)

PART D

- 5.
- 5.1 What are “allergen extracts”? (10 marks)
- 5.2 Briefly describe how the allergen extracts are prepared. (15 marks)
- 5.3 Monoclonal antibodies are produced using the hybridoma technology by immunizing animals. In this production process, different types of hybridomas are produced.
- 5.3.1 What are the two cell types used to form the hybridomas in this process? (10 marks)
- 5.3.2 Explain how the required hybridoma cell type is selected. (25 marks)
- 5.3.3 Write five ways you can minimize the degradation of monoclonal antibody products. (15 marks)
- 5.4
- 5.4.1 Plant and plant parts with immunomodulatory activities have been used in herbal medicine. Write three such plants with one active ingredient and two clinical indications for each of them. (15 marks)
- 5.4.2 Immunoassays have been widely used in many important areas of pharmaceutical analysis. Write a brief description on non-competitive immunoassays. (10 marks)

PART E

- 6.
- 6.1 Briefly explain the following.
- 6.1.1 Measures can be taken to improve the medicinal plant sector in Sri Lanka (15 marks)
- 6.1.2 Good collection practices for medicinal plants (15 marks)
- 6.1.3 Factors to be considered in incorporating herbal medicine into national health system (20 marks)

PART F

- 6.2
- 6.2.1 According to the following table write the common/botanical name and two major pharmacological actions of following plants. (30 marks)

Botanical Name	Common Name	Major Pharmacological Activities
a)	Neem	f)
Allium sativum	d)	g)
b)	Black pepper	h)
c)	Turmeric	i)
Zingiber officinale	e)	j)

- 6.2.2 Write a short note on the importance of clinical pharmacognosy. (20 marks)

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