



UNIVERSITY OF RUHUNA – FACULTY OF ALLIED HEALTH SCIENCES
DEPARTMENT OF PHARMACY
SECOND BPHARM PART II EXAMINATION-JUNE/JULY 2023
PH 2254 PHARMACOGNOSY IB – SEQ PAPER

TIME: THREE HOURS

INSTRUCTIONS

- Answer all questions.
- No paper should be removed from the examination hall.
- Do not use any correction fluid.
- Use illustrations where necessary.

PART A

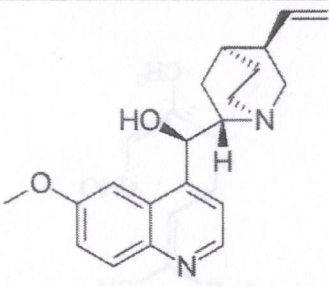
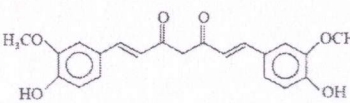
01.

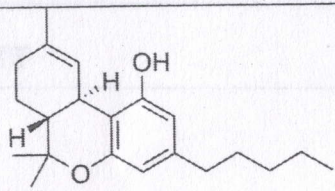
1.1 Briefly explain the classification of alkaloids based on the origin and location of Nitrogen atom.

(25 marks)

1.2 Fill in the blanks.

(60 marks)

Name of the metabolite	Structure	Natural source	Pharmacological uses
1.2.1.....		1.2.2	1.2.3.....
Nicotine	1.2.4.....	1.2.5.....	1.2.6.....
1.2.7.....		1.2.8.....	Anticancer/Antimicrobial (under trial)
Eugenol	1.2.9.....	1.2.10.....	Used in dental fillings

Cinnamaldehyde	1.2.11.....	1.2.12.....	Mouth wash
1.2.13.....		1.2.14.....	1.2.15.....

1.3 Following heterocyclic systems are found in different alkaloids. Give one example of alkaloid for each of the heterocyclic systems mentioned below. (15 marks)

1.3.1 Piperidine

1.3.2 Pyridine

1.3.3 Tropane

1.3.4 Indole

1.3.5 Pyrrolidine

02.

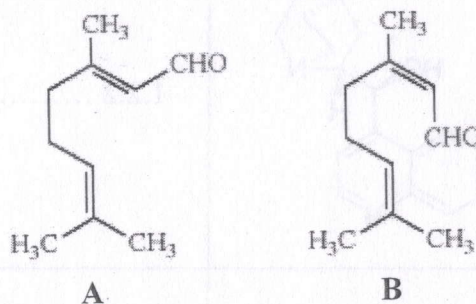
2.1 List five techniques used for the extraction of essential oils. (10 marks)

2.2 State five uses of essential oils with one example for each. (20 marks)

2.3 Draw the structure of (*R*)-Limonene. (10 marks)

2.4 A and B are monoterpenes.

2.4.1 Identify the structures A and B. (10 marks)



2.4.2 Propose a biosynthetic pathway for the conversion of A to B. Include the names of enzymes where necessary. (30 marks)

2.5 Briefly discuss the major differences between essential oils and fixed oils. (20 marks)

03.

3.1 What is the natural source of penicillin? (04 marks)

3.2 Draw and name the three amino acids required for the biosynthesis of penicillin. (21 marks)

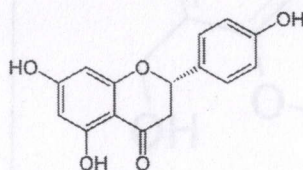
3.3 Morphine is an analgesic drug belonging to phenanthrene group of alkaloids.

3.3.1 Name the source plant that produces morphine. (05 marks)

3.3.2 Draw the structure of precursor amino acid of morphine biosynthesis. (10 marks)

3.3.3 Draw the chemical structures of morphine and codeine. (20 marks)

3.4 Chemical structure of the flavanone naringenin is given below.



3.4.1 Draw the structures of malonyl CoA and cinnamoyl CoA derivative that result naringenin. **(25 marks)**

3.4.2 How many malonyl CoA molecules will react with cinnamoyl CoA to give naringenin? **(05 marks)**

3.4.3 Draw the structure of precursor chalcone of naringenin. **(10 marks)**

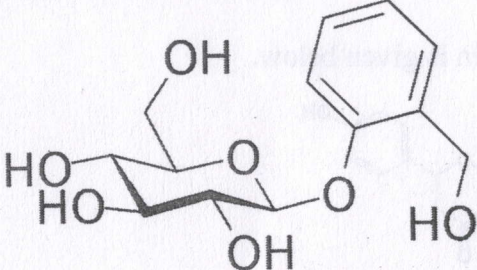
PART B

04. Glycosides are natural products with one or more sugar moieties attached to it.

4.1 Outline the classification of glycosides depending on bridging atoms and types of aglycone. **(12 marks)**

4.2 Mention the common name, biological source and one medicinal property of below given structural aglycones. **(18 marks)**

Type of aglycone	Common name	Biological source	Medicinal property
<p style="text-align: center;">Glucose</p>	4.2.1	4.2.2	4.2.3
	4.2.4	4.2.5	4.2.6

	4.2.7	4.2.8	4.2.9
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4.3 Briefly explain the composition of starch. (30 marks)

4.4 List two pharmaceutical uses for each of the compounds given below. (15 marks)

4.4.1 Alginate

4.4.2 Agar

4.4.3 Pectin

4.5 Write a short note on the advantages of natural gums and mucilage. (25 marks)

05.

5.1 Briefly explain the classification of tannins using a flow chart. (20 marks)

5.2 Write short notes on following topics.

5.2.1 Medicinal properties of tannins (25 marks)

5.2.2 Refining of crude oil (25 marks)

5.2.3 Iodine value (20 marks)

5.3 State the natural source of the following oils. (10 marks)

5.3.1 Castor oil

5.3.2 Oil of theobroma

PART C

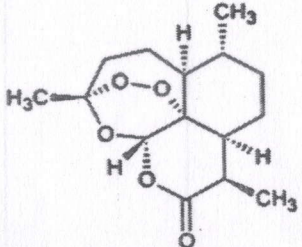
06. Terpenoids represent a highly diverse group of natural products with pharmaceutical uses.

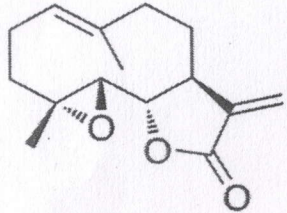
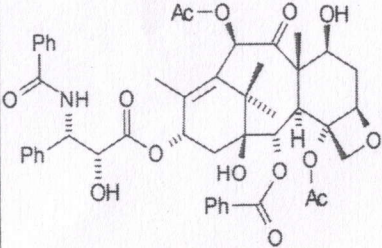
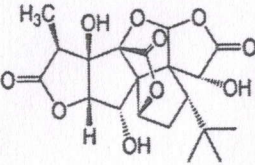
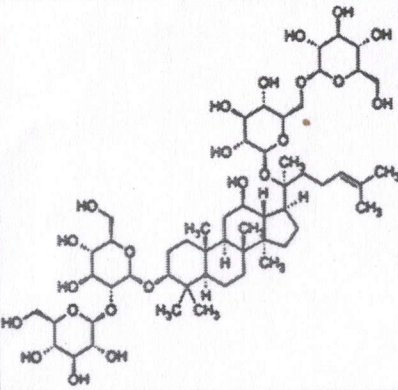
6.1 Write one pharmaceutical use for each of the following monoterpenoids. (10 marks)

6.1.1 Menthol

6.1.2 Thymol

6.2 Complete the following table related to pharmaceutically important terpenoids. (45 marks)

Structure	Name of the terpenoid	Type of the terpenoid	Biological source of the terpenoid
	6.2.1.....	6.2.2.....	6.2.3.....

	6.2.4.....	6.2.5.....	6.2.6.....
	6.2.7.....	6.2.8.....	6.2.9.....
	6.2.10.....	6.2.11.....	6.2.12.....
	6.2.13.....	6.2.14.....	6.2.15.....

6.3 Hallucinogens are drugs that change a person's perception of reality. Write the names of hallucinogens isolated or derived from following species. **(25 marks)**

- 6.3.1 *Claviceps purpurea*
- 6.3.2 *Psilocybe mexicana*
- 6.3.3 *Lophophora williamsii*
- 6.3.4 *Amanita muscaria*
- 6.3.5 *Bufo alvarius*

6.4 Write the major toxic compounds of following poisonous plants. **(20 marks)**

- 6.4.1 *Thevetia peruviana*
- 6.4.2 *Strychnos nux-vomica*
- 6.4.3 *Gloriosa superba*
- 6.4.4 *Ricinus communis*

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