



UNIVERSITY OF RUHUNA – FACULTY OF ALLIED HEALTH SCIENCES

DEPARTMENT OF PHARMACY

SECOND BPHARM PART II EXAMINATION – SEPTEMBER 2020

PH 2254 PHARMACOGNOSY IB (SEQ)

TIME: THREE HOURS

INSTRUCTIONS

- There are **six** questions in the parts **A, B, C** and **D** in the 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

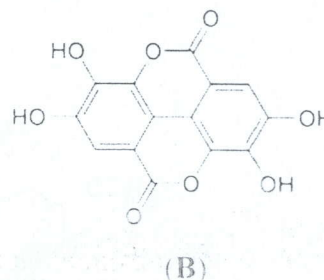
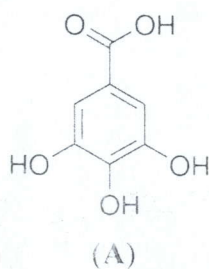
01.

- 1.1 Briefly explain the chemical composition of acacia. (20 marks)
- 1.2 List **six** pharmaceutical uses of agar. (12 marks)
- 1.3 Name the **four** common species which are used to obtain pharmaceutical grade alginate. (08 marks)
- 1.4 State the difference between oleoresin and glycoresin giving **one** example for each. (10 marks)
- 1.5 Write short notes on following.
 - 1.5.1 Cannabis (25 marks)
 - 1.5.2 Capsicum (25 marks)

PART B

02.

- 2.1 What are tannins? (10 marks)
- 2.2 State four medicinal uses of tannins. (20 marks)
- 2.3 True tannins are mainly categorized into hydrolysable tannins and condensed tannins.
 - 2.3.1 Briefly explain the difference between these two categories. (20 marks)
 - 2.3.2 Mention the **two** principle types of hydrolysable tannins. (10 marks)
 - 2.3.3 Name the **two** compounds shown below. (10 marks)



- 2.3.4 Name **two** plants which contain hydrolysable tannins. (10 marks)
- 2.3.5 Mention a plant for each given plant part in which the condensed tannins can be found. (20 marks)

- 3.1 What are terpenoids? (10 marks)
- 3.2 State **four** methods of isolation of terpenoids from plants. (10 marks)
- 3.3 Briefly describe the isoprene rule in the formation of terpenoids. (20 marks)
- 3.4 Briefly describe the classification of terpenoids related to the isoprene units and number of rings present in the structure. (30 marks)
- 3.5 Eucalyptus oil is rich with terpenoids.
- 3.5.1 Name **two** terpenoids found in Eucalyptus oil. (10 marks)
- 3.5.2 What is the method of preparation of Eucalyptus oil? (10 marks)
- 3.5.3 State **four** pharmaceutical uses of Eucalyptus oil. (10 marks)

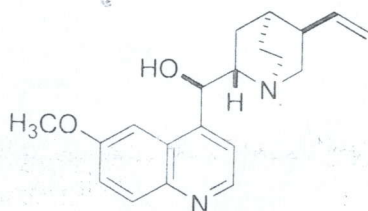
PART C

04.

- 4.1 Sesame oil, known as gingerly oil is extracted from *Sesamum indicum* plant.
- 4.1.1 Name **two** unsaturated fatty acids which are abundant in sesame oil. (10 marks)
- 4.1.2 List **three** pharmaceutical uses of sesame oil. (15 marks)
- 4.2 What is meant by the term "wax". Give **two** examples. (15 marks)
- 4.3 Cinnamon oil is extracted from *Cinnamomum zeylanicum* plant in Sri Lanka.
- 4.3.1 State the principle constituent of cinnamon oil. (05 marks)
- 4.3.2 Give **two** different pharmaceutical preparations which contain cinnamon oil. (10 marks)
- 4.4 Write short accounts on each monoterpene given below (chemical structure, subclass, plant source, one pharmaceutical use should be provided). (45 marks)
- 4.4.1 Menthol
- 4.4.2 Camphor
- 4.4.3 Citral

PART D

05. Alkaloids are considered as one of the major natural products produced by living organisms.
- 5.1 List the main functions of alkaloids in plants. (20 marks)
- 5.2 Briefly describe the distinguishing structural features of the following pairs of alkaloids. Use appropriate chemical structures to justify your answer. (20 marks)
- 5.2.1 Ephedrine and pseudo-ephedrine
- 5.2.2 Nicotine and anabasine
- 5.3 Answer the following questions based on the alkaloid 'quinine' whose structure is given below.



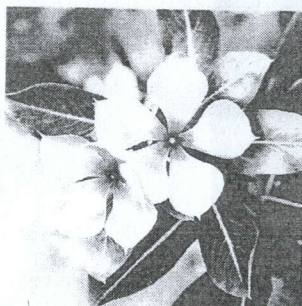
- 5.3.1 Quinine belongs to group of alkaloid. (05 marks)
- 5.3.2 It was isolated from the bark of (05 marks)
- 5.3.3 Actively involved in the treatment of

5.3.4 is the isomer of quinine. (05 marks)

5.3.5 This isomer is used for the treatment of (05 marks)

5.3.6 Draw the structure of isomer you mentioned in 5.3.4. (10 marks)

5.4 Following questions are based on *Catharanthus* sp. shown below.



5.4.1 Give **two** major alkaloids isolated from this plant. (10 marks)

5.4.2 The two alkaloids you mentioned in 5.4.1 are complex dimers of a type of a heterocycle. Name this specific heterocycle. (05 marks)

5.4.3 What is the major pharmacological activity of the alkaloids you mentioned in 5.4.1? (05 marks)

5.4.4 List **one** semi-synthetic derivative based on the structure of the major alkaloids isolated from this plant. (05 marks)

06.

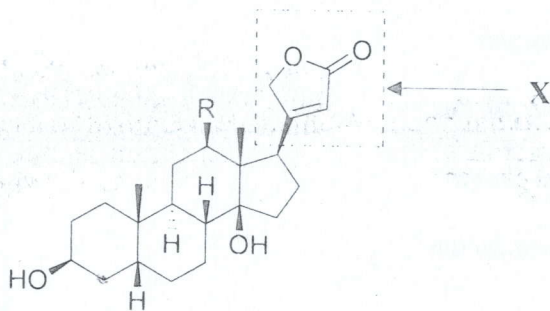
6.1 The term glycoside is a generic term for a natural product that is chemically bound to a sugar via a glycosidic bond.

6.1.1 How would you classify glycosides according to the glycosidic linkage? (10 marks)

6.1.2 Among the types of glycosides you mentioned in 6.1.1, which type of glycoside is most abundant in plants? (05 marks)

6.1.3 What is the advantage of having a sugar molecule attached to a glycosidic drug? (05 marks)

6.2 Following structure shows the aglycone part of one of the important cardiac glycosides.



6.2.1 Give the names of the compounds when

6.2.1.1. $R = OH$ (05 marks)

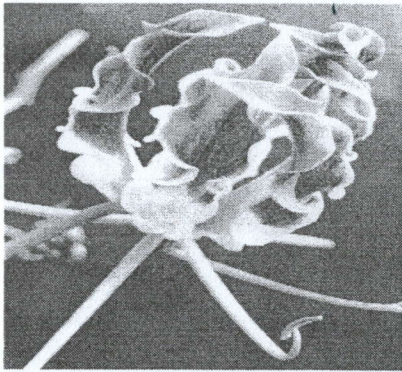
6.2.1.2. $R = H$ (05 marks)

6.2.2 What is the source of the two compounds you mentioned in 6.2.1? (05 marks)

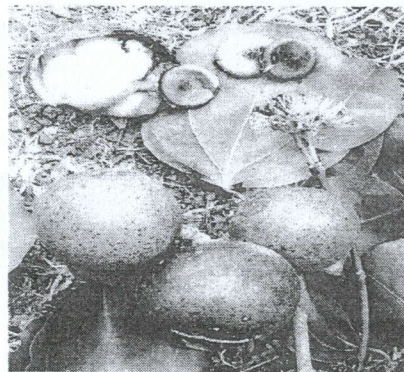
6.2.3 Give the general name of the compound generated when the group named as "X" is replaced by a pyran ring with similar functionality. (05 marks)

6.3 Some of the poisonous plants grow in Sri Lanka are shown below. Identify the plants and indicate the major toxic compound. (30 marks)

6.3.1



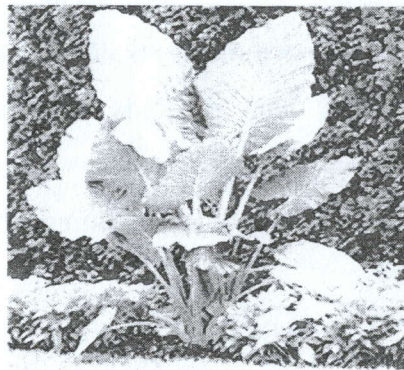
6.3.2



6.3.3



6.3.4



6.3.5



6.4 Name the major psychoactive compound isolated or derived from each of the following species. (20 marks)

6.4.1 *Salvia divinorum*

6.4.2 *Claviceps purpurea*

6.4.3 *Tabernanthe iboga*

6.4.4 *Papaver somniferum*

6.4.5 *Amanita muscaria*

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