



**UNIVERSITY OF RUHUNA – FACULTY OF ALLIED HEALTH SCIENCES**  
**DEPARTMENT OF PHARMACY**  
**SECOND BPHARM PART II EXAMINATION-AUGUST 2022**  
**PH 2254 PHARMACOGNOSY IB – SEQ**

**TIME: THREE HOURS**

**INSTRUCTIONS**

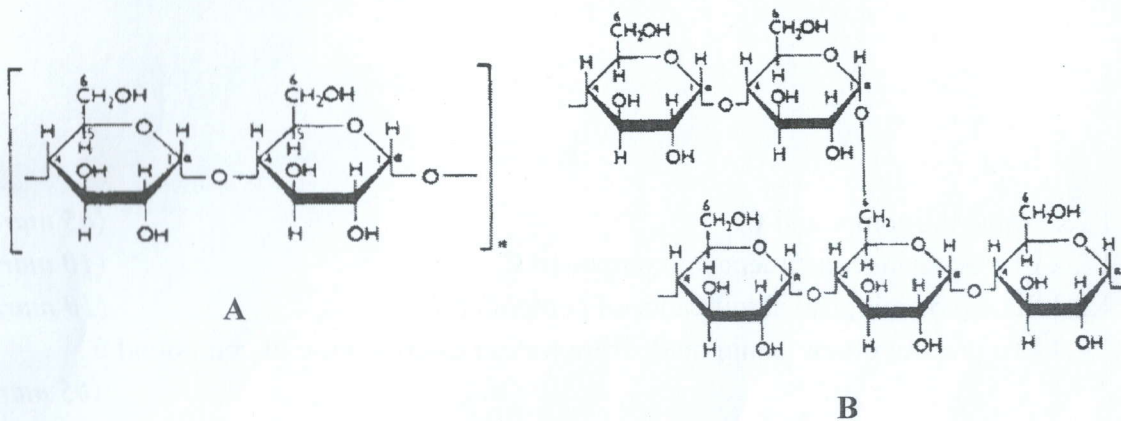
- Answer all questions.
- No paper should be removed from the examination hall.
- Do not use any correction fluid.
- Use illustrations where necessary.

**PART A**

1.-

1.1. Starch is one of the most widely distributed organic compounds in plants.

1.1.1 Starch is made from a mixture of following two substances. Name the substances **A** and **B**? (10 marks)



1.1.2 Briefly explain the structural features of substances **A** and **B** you mentioned in 1.1.1. (20 marks)

1.1.3 Briefly describe the pharmaceutical importance of starch. (20 marks)

1.2 Answer the following questions.

1.2.1 How fixed oils are differed from fats and waxes based on their properties? (10 marks)

1.2.2 List two methods of extraction of fixed oils from plant materials. (10 marks)

1.2.3 Following table contains some pharmaceutically important compounds. Complete the table according to the given example. (30 marks)

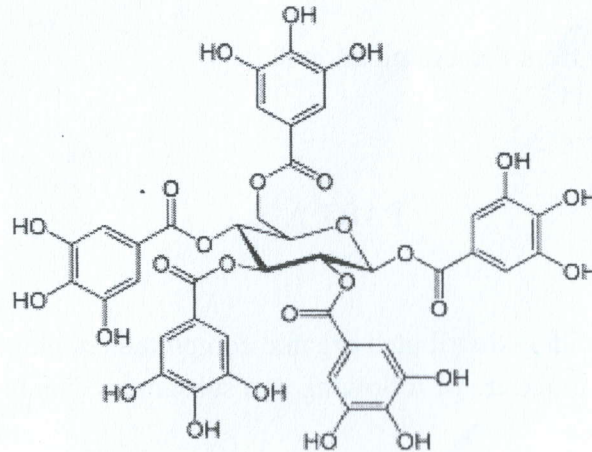
Compound	Biological source	Pharmaceutical use
Eg; Almond oil	Seeds of <i>Prunus amygdalus</i>	Used as a vehicle for oily injections
Castor oil		
Wool fat		
Bees wax		

2.

2.1 Tannins can be classified in to two major groups.

2.1.1 List the two major groups of tannins and briefly explain how tannins are classified according to the Goldbeaters skin test. (20 marks)

2.1.2 One of the two main types of hydrolysable tannins is made from following compound C.



C

2.1.2.1 Name the compound C. (05 marks)

2.1.2.2 List the main constituents of compound C. (10 marks)

2.1.2.3 State the biological significance of compound C. (10 marks)

2.1.2.4 List one important tannin made from further esterification of compound C. (05 marks)

2.2 Glycosides are a type of plant drugs, in which a sugar residue is covalently bind to an aglycone.

2.2.1 What are the advantages of having a sugar residue and an aglycone in glycosides? (10 marks)

2.2.2 Write two aglycones found in anthraquinone glycosides. (10 marks)

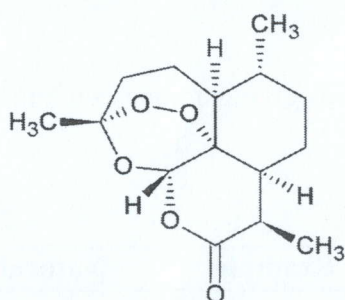
2.2.3 Complete the following table. (30 marks)

Compound	Biological source	Pharmaceutical use
2.2.3.1. Aloin A		
2.2.3.2. Digoxin		
2.2.3.3. Glycyrrhizin		



3.

3.1 Compound **X** shown below is an important sesquiterpenoid lactone with a plant origin.



**X**

3.1.1 Identify the compound **X**.

(05 marks)

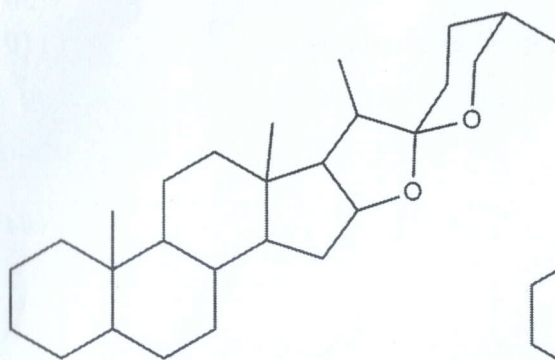
3.1.2 Name the medicinal use of this molecule.

(05 marks)

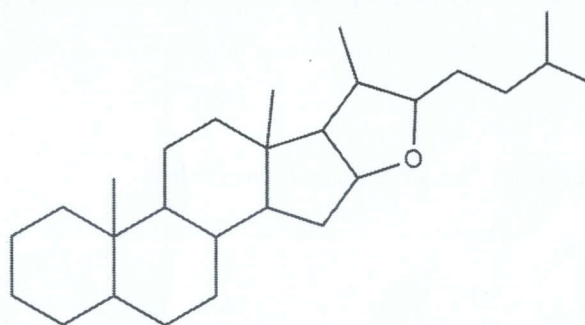
3.1.3 State two semi-synthetic derivatives of compound **X** with similar medicinal properties.

(10 marks)

3.2 Following structures represent the two main types of aglycones in steroidal saponins.



**Y**



**Z**

3.2.1 Name the structures **Y** and **Z**.

(10 marks)

3.2.2 Compare and contrast the structural features of **Y** and **Z**.

(30 marks)

3.3 Complete the following table related to terpenoid crude drugs.

(40 marks)

Compound	Biological source	Plant part	Pharmaceutical use
3.3.1 Taxol			
3.3.2 Ginseng			
3.3.3 Stevioside			
3.3.4 Ginkgo			
3.3.5 Parthenolide			

## PART B

4. Answer all questions.

4.1

4.1.1 Write a short account on alkaloids giving emphasis to major types and examples for each. (30 marks)

4.1.2 Complete the following table. (40 marks)

Type of alkaloid	Example	Natural source	Medicinal use
4.1.2.1 Pyridine alkaloid			
4.1.2.2 Quinoline alkaloid			
4.1.2.3 Indole alkaloid.			
4.1.2.4 Tropane alkaloid			
4.1.2.5 Piperidine alkaloid			

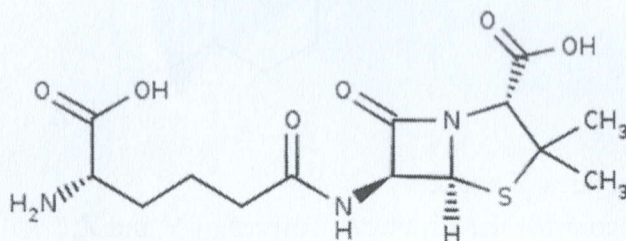
4.2.

4.2.1 Draw the chemical structures of geranial and neral. (Hint: Geranial and neral are isomers of citral). (20 marks)

4.2.2 List two methods used for the extraction of essential oils. (10 marks)

5.

5.1 Identify the structure shown below. (04 marks)



5.2 Name three amino acids which are used in the biosynthesis of above molecule and draw the chemical structure of each amino acid. (36 marks)

5.3

5.3.1 List two classes of antibiotics derived from the above structure. (10 marks)

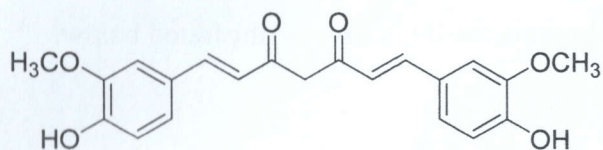
5.3.2 Using a diagram, show the major difference between the two classes mentioned in 5.3.1. (10 marks)

5.4 What is the mode of action of the two classes of antibiotics mentioned in 5.3.1? (08 marks)

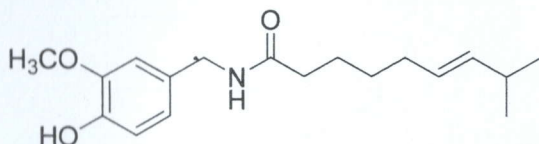


5.5 Identify the following medicinally important chemical compounds. Name one natural source of each compound. (32 marks)

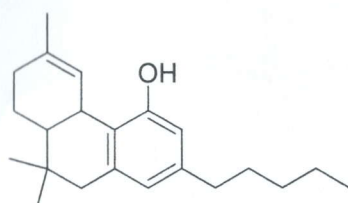
5.5.1



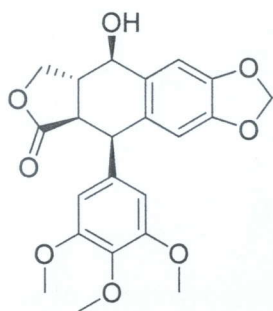
5.5.2



5.5.3

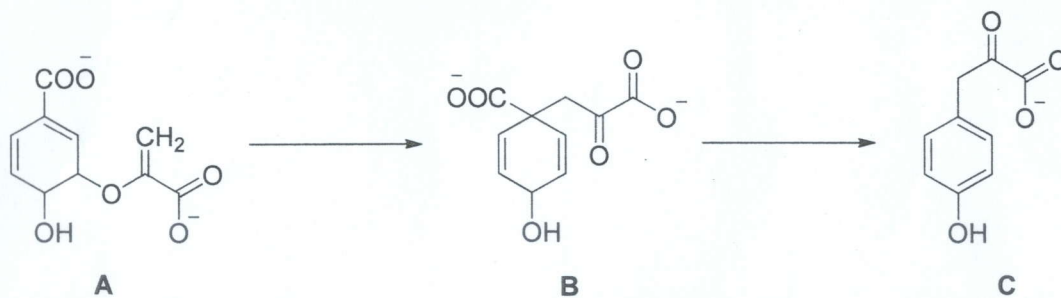


5.5.4



6.

6.1 Two of the intermediate steps of biosynthesis of 4-hydroxyphenyl pyruvate are given below.



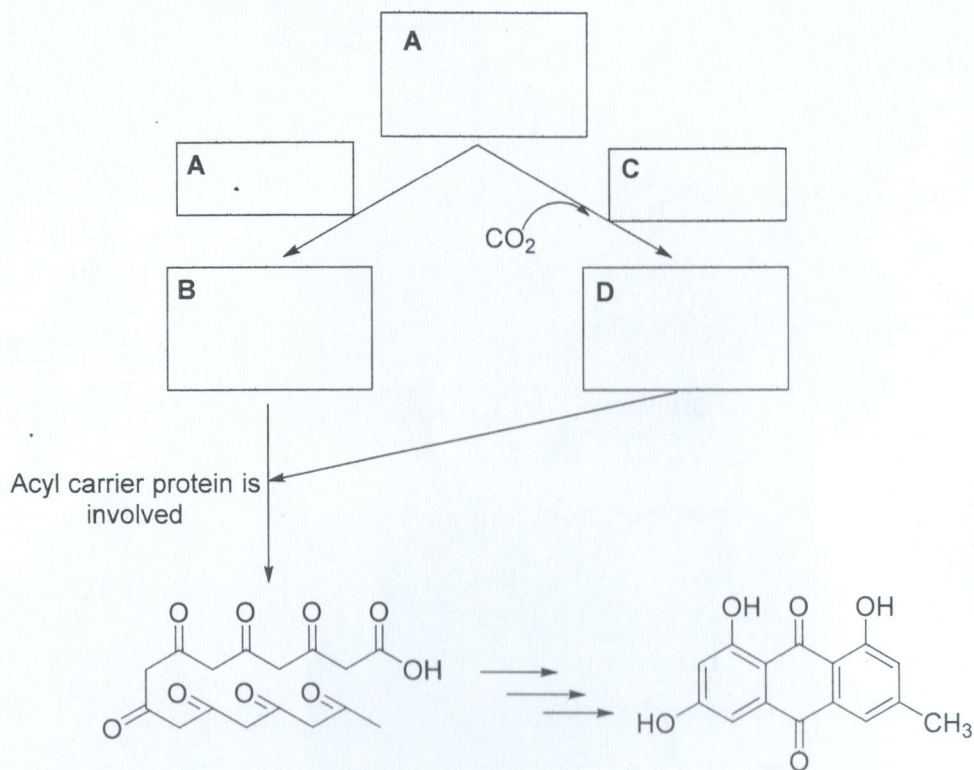
6.1.1 Identify the compound A. (05 marks)

6.1.2 Draw the correct arrow pushing for Claisen rearrangement of compound A for the biosynthesis of B. (15 marks)

6.1.3 Shikimic acid and one of the intermediates formed during glycolysis are the precursor molecules of compound A. Draw the structures of precursor molecules of compound A. (20 marks)

6.1.4 Name and draw the structures of two amino acids biosynthesized from 4-hydroxyphenyl pyruvate (C). (20 marks)

6.2 Biosynthesis pathway of an anthraquinone derivative is illustrated below.



6.2.1 Draw the structures of compounds A, B and D. (30 marks)

6.2.2 Identify enzyme C. (05 marks)

6.2.3 How many molecules of D are involved in the biosynthesis of above anthraquinone? (05 marks)

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