



UNIVERSITY OF RUHUNA – FACULTY OF ALLIED HEALTH SCIENCES

DEPARTMENT OF PHARMACY

FOURTH BPHARM PART I EXAMINATION – NOVEMBER/DECEMBER 2023

PH 4112 ADVANCED MEDICINAL CHEMISTRY I – SEQ PAPER

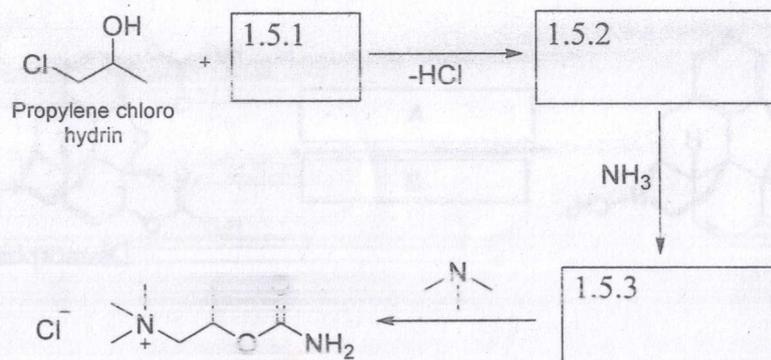
TIME: TWO HOURS

INSTRUCTIONS

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

01.

- 1.1 State the two types of acetyl choline receptors present in human body. **(04 marks)**
- 1.2 Giving chemical structures and relevant enzymes, draw the biosynthetic pathway of acetylcholine. **(26 marks)**
- 1.3 Give one example for each of the following. **(10 marks)**
- 1.3.1 Reversible acetylcholinesterase inhibitor
- 1.3.2 Irreversible acetylcholinesterase inhibitor
- 1.3.3 Direct cholinergic agonist
- 1.3.4 Direct cholinergic antagonist
- 1.4 Briefly explain the structure activity relationships of acetylcholine analogues. **(30 marks)**
- 1.5 Fill in the blanks of the following reaction scheme. **(15 marks)**



- 1.6 State three differences between quaternary ammonium antimuscarinic drugs and tertiary amine antimuscarinic drugs. **(15 marks)**

02.

2.1 Mention the role of following enzymes in biosynthesis of prostaglandins. (12 marks)

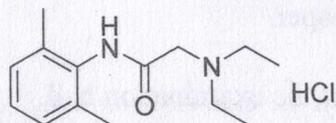
2.1.1 Phospholipase A2

2.1.2 Cyclooxygenase

2.2 Name three clinically important prostaglandins giving one indication for each. (18 marks)

2.3 Briefly explain the mode of action of local anesthetics. (15 marks)

2.4 Draw a synthetic scheme for the synthesis of lidocaine hydrochloride starting from 2,6-dimethylnitrobenzene. (35 marks)



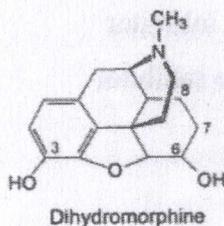
Lidocaine HCl

2.5 Briefly explain the structure activity relationships of local anesthetics. (20 marks)

03.

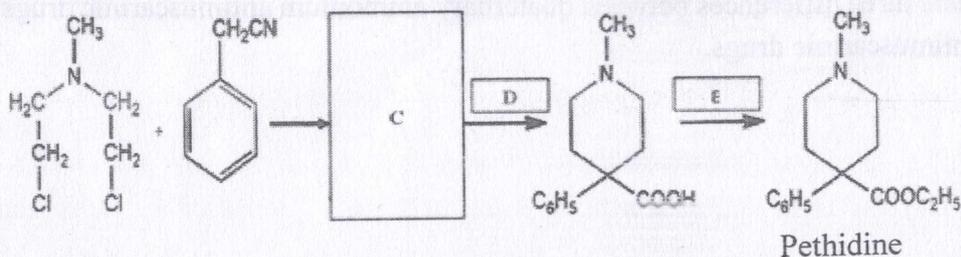
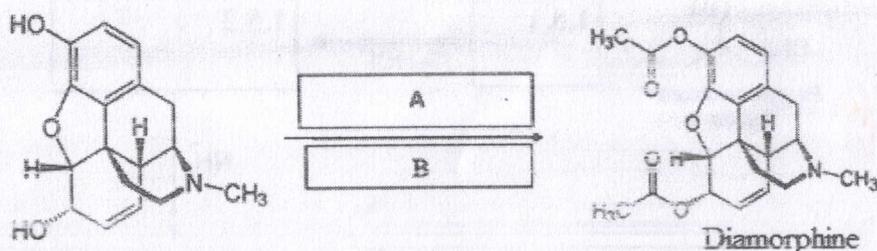
3.1 List three structural modifications of morphine related to structure activity relationships (SAR) of morphine. (15 marks)

3.2 Explain briefly why dihydromorphine is more potent than the morphine considering the SARs of morphine. The structure of dihydromorphine is given below. (15 marks)



Dihydromorphine

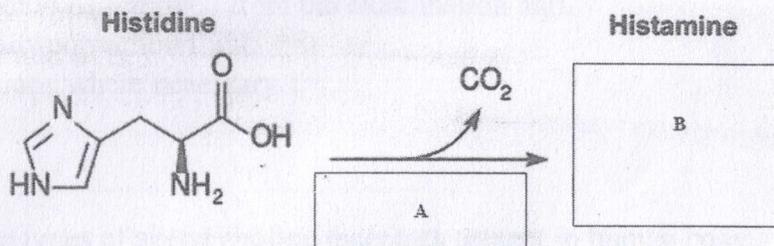
3.3 Write the missing reagents and intermediates (if any) of following synthetic schemes. (25 marks)



- 3.4 List three importance of inorganic pharmaceuticals. (15 marks)
- 3.5 Write three inorganic compounds that are used as antacids. (15 marks)
- 3.6 State the medicinal importance of following elements. (15 marks)
- 3.6.1 Li
- 3.6.2 Pt
- 3.6.3 Bi

04.

- 4.1 Complete the following biosynthesis pathway of histamine. (10 marks)



- 4.2 Write the chemical classification of second-generation antihistamines based on their structure giving one example for each. (20 marks)
- 4.3 First generation antihistamines are more sedative when compared with second generation antihistamines. Comment. (25 marks)
- 4.4 State three examples for in-vivo bioassays. (15 marks)
- 4.5 Write short notes on the following.
- 4.5.1 High-throughput biological screenings (15 marks)
- 4.5.2 Bioassay-Guided Fractionation (BGF) (15 marks)

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