



UNIVERSITY OF RUHUNA – FACULTY OF ALLIED HEALTH SCIENCES

DEPARTMENT OF PHARMACY

FOURTH BPHARM PART I EXAMINATION – APRIL 2023

PH4112 ADVANCED MEDICINAL CHEMISTRY I – SEQ PAPER

TIME: TWO HOURS

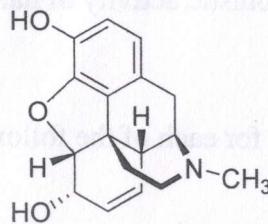
INSTRUCTIONS

- There are four questions in **Part A and B** 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.

PART A

01.

- 1.1 The structure of morphine is given below. Illustrate the chemical structures of codeine and diamorphine. **(10 marks)**



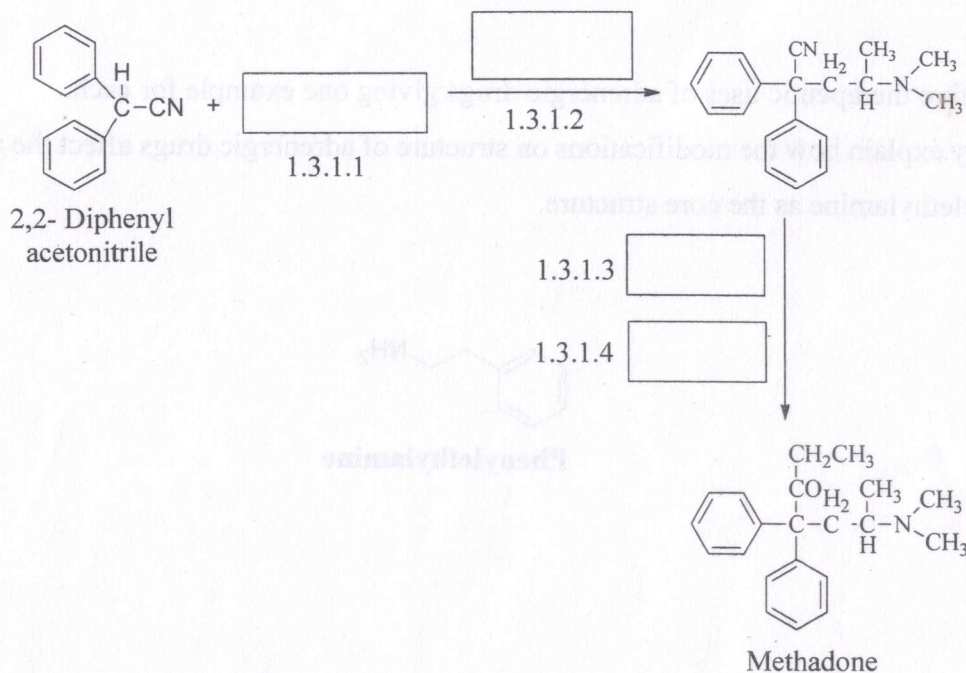
- 1.2 State two endogenous peptide neurotransmitters that produce morphine-like effects.

(10 marks)

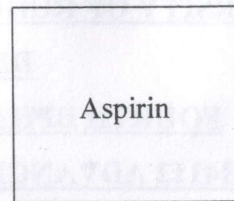
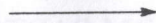
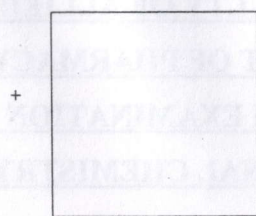
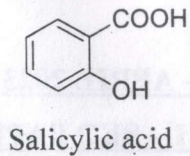
- 1.3 Identify the missing reagents and intermediates in the following synthetic schemes.

(30 marks)

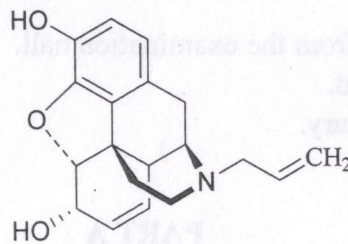
1.3.1



1.3.2



1.4 The structure of nalorphine is given below.



1.4.1 Compare the structure of morphine with nalorphine. (10 marks)

1.4.2 Briefly explain the antagonistic activity of nalorphine using SAR of morphine. (10 marks)

1.5 List two inorganic compounds for each of the following gastrointestinal agents. (30 marks)

1.5.1 Acidifying agents

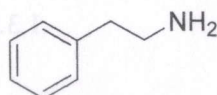
1.5.2 Antacids

1.5.3 Saline cathartics

02.

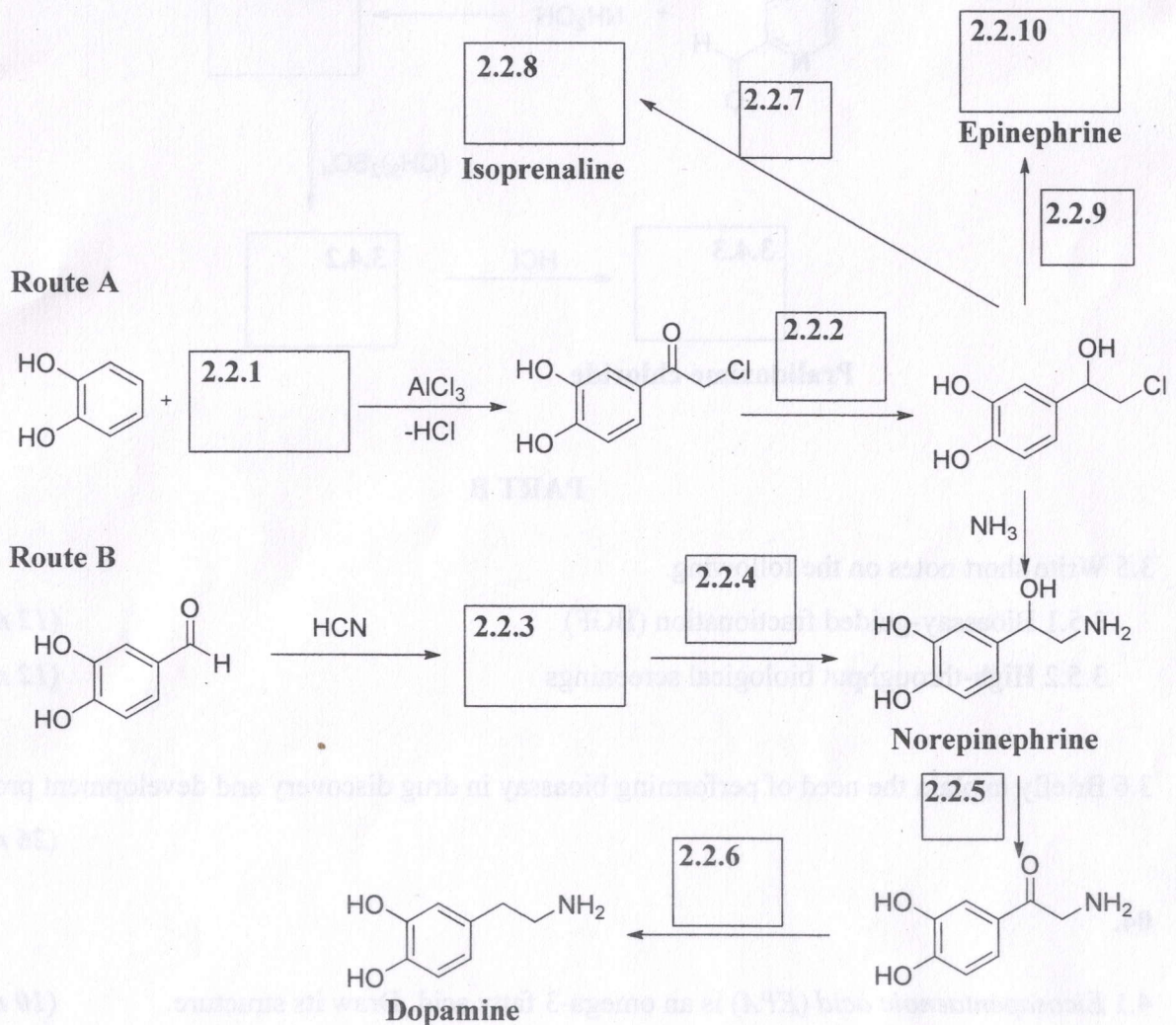
2.1 State five therapeutic uses of adrenergic drugs giving one example for each. (20 marks)

2.2 Briefly explain how the modifications on structure of adrenergic drugs affect the activity using phenylethylamine as the core structure. (30 marks)



Phenylethylamine

2.3 A Synthesis plan for several catecholamines is given below. Fill in the missing reagents and products. (50 marks)



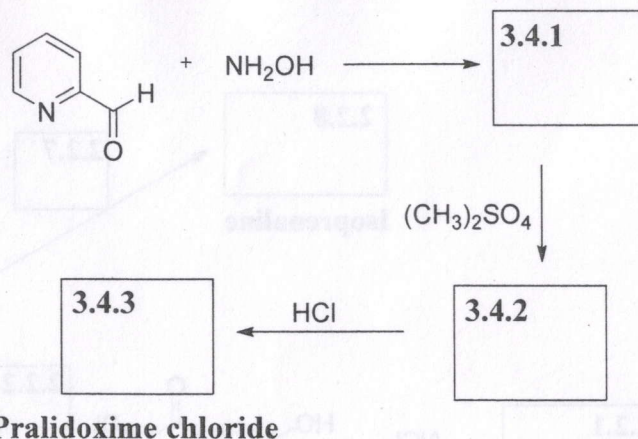
03.

3.1 List three therapeutic uses of prostaglandins. (06 marks)

3.2 Both prostaglandins and leukotrienes are biosynthesized from arachidonic acid. What are the two major enzymes involved in these two pathways? (04 marks)

3.3 Briefly explain the modes of action of pralidoxime and atropine in organophosphate poisoning. (16 marks)

3.4 Complete the following synthetic pathway of pralidoxime. (24 marks)



PART B

3.5 Write short notes on the following.

3.5.1 Bioassay-guided fractionation (BGF) (12 marks)

3.5.2 High-throughput biological screenings (12 marks)

3.6 Briefly explain the need of performing bioassay in drug discovery and development process. (26 marks)

04.

4.1 *Eicosapentaenoic acid (EPA)* is an omega-3 fatty acid. Draw its structure. (10 marks)

4.2 The essential pharmacophore for histamine H₁ antagonistic activity is given below. Briefly explain four-important structural features required for the optimum antihistaminic activity. (20 marks)

