Fourth B pharm part I (6) Index No:.....

UNIVERSITY OF RUHUNA – FACULTY OF ALLIED HEALTH SCIENCES
DEPARTMENT OF PHARMACY
FOURTH BPHARM PART I EXAMINATION – MARCH/APRIL 2021
PH 4112 ADVANCED MEDICINAL CHEMISTRY I - SEQ

TIME: TWO HOURS

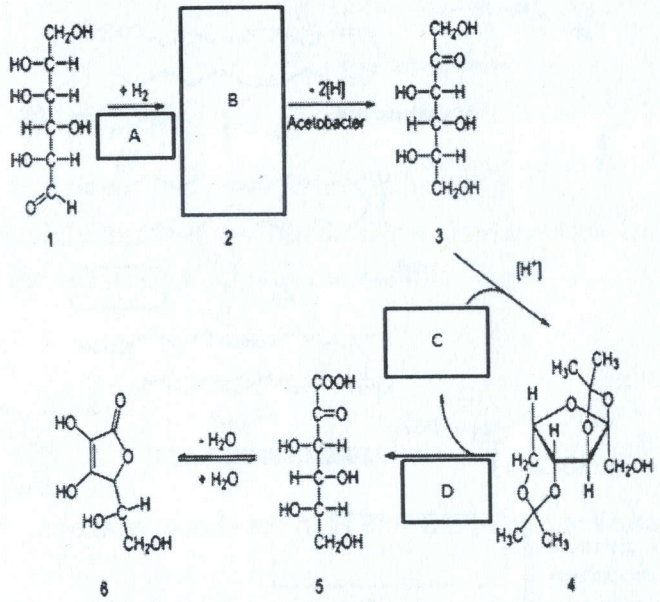
INSTRUCTIONS

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

01.

1.1 The Reichstein process for the commercial production of ascorbic acid (**6**) from D-glucose (**1**) is given below:

1.1.1. Complete the missing reagents and intermediates (**A-D**). ***(20 marks)***



1.1.2 What is the role of *Acetobacter* in the above process? ***(05 marks)***

1.1.3 Briefly explain two-novel modifications introduced to shorten the above process. ***(10 marks)***

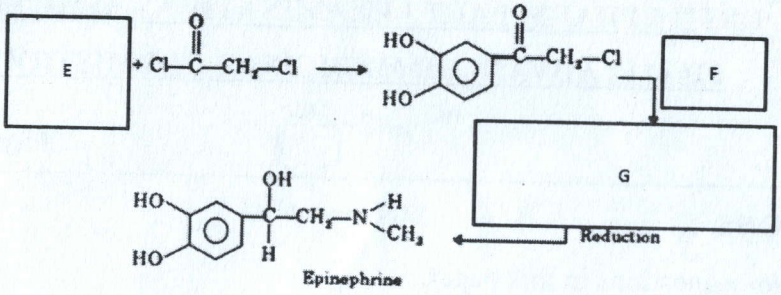
1.2 The sympathomimetic agents can be divided into catechol and non-catechol amines.

1.2.1 Name one example drug for each category. ***(05 marks)***

1.2.2 Draw the chemical structures of the drugs mentioned in 1.2.1. ***(10 marks)***

1.2.3 Briefly explain the important structural features required for the greatest activity of the sympathomimetic drugs in general. ***(20 marks)***

1.2.4 Identify the starting compound, missing reagents and intermediates (**E-G**) in the following synthesis of Epinephrine. (***15 marks***)



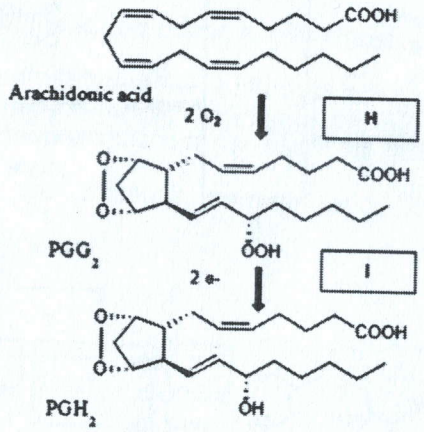
1.3 Briefly explain the need of performing bioassay in drug discovery and development process. (***15 marks***)

02.

2.1

2.1.1 List five-chemical mediators of inflammation and immune reactions. (***15 marks***)

2.1.2 Name the classes of enzymes **H-I** involve in the following synthesis of Prostaglandin H_2. (***10 marks***)

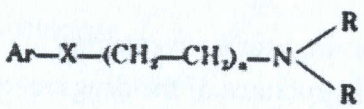


2.1.3 Explain the role of enzyme **H** in the above synthesis. (***10 marks***)

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

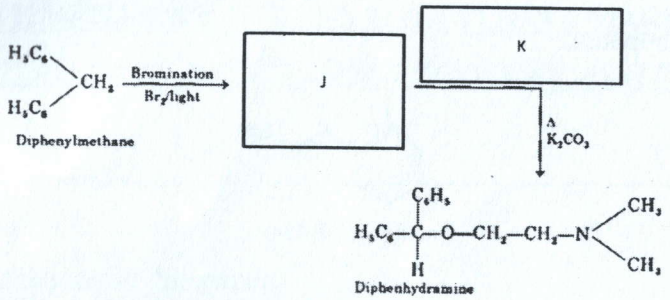
2.2

2.2.1 The essential pharmacophore for histamine H_1 antagonistic activity is given below. Briefly explain four-important structural features required for the optimum antihistaminic activity. (***20 marks***)

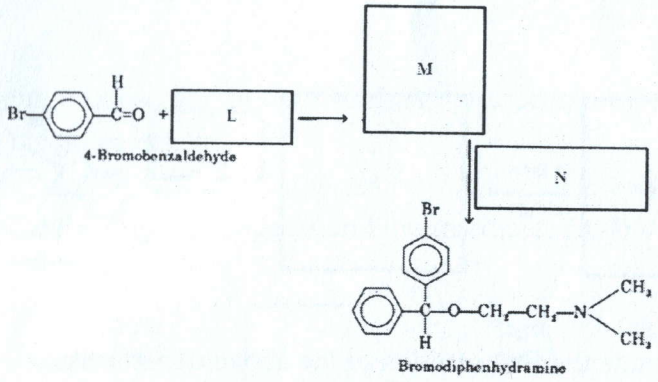


(7)

2.2.2 Complete the missing reagents and intermediates (**J-K**) in the following synthetic scheme of diphenhydramine. (***15 marks***)

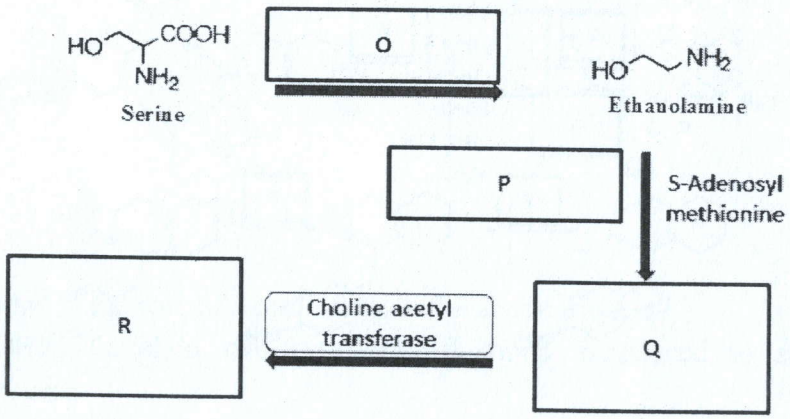


2.2.3 Complete the missing reagents and intermediates (**L-N**) in the following synthetic scheme of bromodiphenhydramine. (***20 marks***)



03.

3.1 Biosynthesis of acetylcholine is given below. Complete the biosynthetic scheme with relevant names of the enzymes and products (**O-R**). (***20 marks***)



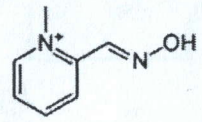
3.2 Cholinoceptor agonists act on muscarinic receptors and nicotinic receptors.

3.2.1 State the Ing's rule of five? (***10 marks***)

3.2.2 Explain briefly the important structure activity relationships of cholinoceptor agonists in bringing out the pharmacological activities. (***20 marks***)

3.3 What effect is referred to as "cholinergic crisis". (***10 marks***)

3.4 The structure of Pralidoxime (PAM) is shown below. Provide the stepwise mechanism to show how PAM reverses poisoning of acetylcholine esterase (AChE) by organophosphates. (***40 marks***)



Pralidoxime (PAM)

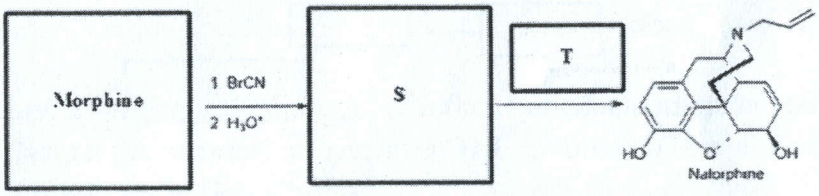
04.

4.1

4.1.1 Explain the role of endorphins associated with the relief of pain. (***10 marks***)

4.1.2 Draw the structure of Morphine. (***05 marks***)

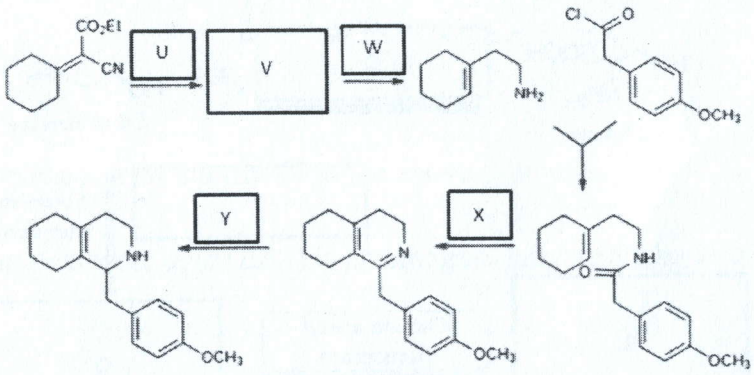
4.1.3 Complete the following synthetic transformation of Morphine to Nalorphine. (***15 marks***)



4.1.4 Give the name the first reaction of the above transformation. (***05 marks***)

4.1.5 State why the reaction named in 4.1.4 is important for the process. (***10 marks***)

4.1.6 The Bischler-Napieralski reaction is used in the synthesis of morphinan precursors. Identify the missing reagents and intermediates (**U-Y**) in the following synthetic scheme. (***25 marks***)



4.2 Write short notes on

4.2.1 Structure based drug design (***15 marks***)

4.2.2 Nomenclature of drug substances (***15 marks***)

@@@@@@@@@@@@