UNIVERSITY OF JAFFNA, SRI LANKA
BACHELOR OF PHARMACY
THIRD YEAR FIRST SEMESTER EXAMINATION – JANUARY 2016
PHAMC 3101 MEDICINAL CHEMISTRY I - PAPER II

Date: 18.02.2016 **Time: 2 Hours**

ANSWER ALL EIGHT QUESTIONS.

1. 1.1 Draw a schematic diagram of cholinergic neurotransmission and identify the drug targets. **(40 Marks)**
1.2 Use the chemical structure to explain why the half-life of acetylcholine molecule is very short. **(20 Marks)**
1.3 Describe the structure-activity relationshipof cholinergic antagonist. **(40 Marks)**

2. 2.1 Draw the general structure of catecholamines. **(15 Marks)**
2.2 Draw the structure of salbutamol and indicate which group is responsible for the β_2-agonist activity. **(25 Marks)**
2.3 Isoprenaline used as a lead compound for Propranolol. Describe the steps involved in the development of Propranolol with the relevant chemical structures of the starting material through intermediates. **(60 Marks)**

3. 3.1 Explain themechanism ofcatalysis of theacetylcholinesterase with the required chemical structures. **(70 Marks)**
3.2 Describe the structure activity relationship of Physostigmine. **(30 Marks)**

4. 4.1 List three (03) analogues of chloromethane. **(15 Marks)**
4.2 Briefly describe the mechanism of action of chloromethane. **(50 Marks)**
4.3 Draw the mechanism of action of cisplatin. **(35 Marks)**

5. 5.1 Describe the mechanism of action of cardiac glycosides. **(30 Marks)**
5.2 Describe the structure activity relationship of cardiac glycosides. **(70 Marks)**

6. 6.1 Name the subunits that are found in G protein. **(20 Marks)**
6.2 Name two molecules that can inhibit phosphodiesterases enzyme. **(20 Marks)**
6.3 Schematically show the signal transduction pathway of $G_s$protein. **(60 Marks)**

7. 7.1 Give an example for type I and type II protein kinase inhibitors? **(10 Marks)**
7.2 What is the main difference between type I and type II protein kinase inhibitors? **(20 Marks)**
7.3 Describe the binding interactions of Imatinib with protein kinase. **(70 Marks)**

8. 8.1 Describe the mechanism of action of farnesyl transferase enzyme. **(60 Marks)**
8.2 Draw the structure of the lead compound for the Farnesyl transferase antagonist. **(20 Marks)**
8.3 Explain why the above lead compound cannot be used as a drug. **(20 Marks)**