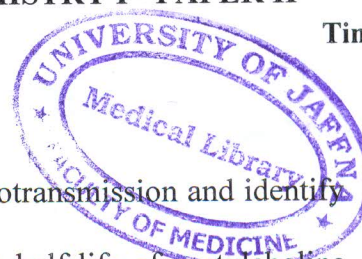


**UNIVERSITY OF JAFFNA, SRI LANKA**  
**BACHELOR OF PHARMACY**  
**THIRD YEAR FIRST SEMESTER EXAMINATION – JANUARY 2016**  
**PHAMC 3101 MEDICINAL CHEMISTRY I - PAPER II**

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 relationship of 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  $\beta_2$ -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 the mechanism of catalysis of the acetylcholinesterase 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 phosphodiesterase 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)