

**UNIVERSITY OF JAFFNA, SRI LANKA**  
**BACHELOR OF PHARMACY**  
**THIRD YEAR FIRST SEMESTER EXAMINATION – NOVEMBER 2014**  
**PHAMC 3101 MEDICINAL CHEMISTRY I**  
**PAPER II**

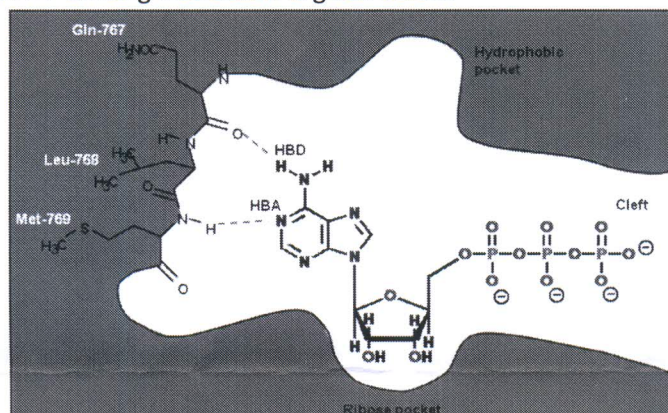
Date: 17/11/2014

Time: 2 Hours

Answer all 8 questions.

- |          |  |                   |
|----------|--|-------------------|
| <b>1</b> | 1.1 Draw the structure of acetylcholine.   | <b>(20 marks)</b> |
|          | 1.2 Describe the structure-activity relationship of acetylcholine.   | <b>(40 marks)</b> |
|          | 1.3 Compare the structural similarities between atropine and acetylcholine molecules.  | <b>(40 marks)</b> |
|          |  |                   |
| <b>2</b> | 2.1 Draw a schematic diagram of adrenergic neurotransmission and indicate drug targets.  | <b>(50 marks)</b> |
|          | 2.2 Describe the steps involved in the drug discovery of Propranolol with the relevant chemical structures of the starting material through intermediates. | <b>(50 marks)</b> |
|          |  |                   |
| <b>3</b> | 3.1 List the indication of Physostigmine?  | <b>(20 marks)</b> |
|          | 3.2 Diagrammatically show how Physostigmine acts on acetylcholine esterase.  | <b>(50 marks)</b> |
|          | 3.3 Describe the structure-activity relationship of Physostigmine.   | <b>(30 marks)</b> |
|          |  |                   |
| <b>4</b> | 4.1 Define the term "Prodrug" with an example.   | <b>(20 marks)</b> |
|          | 4.2 Briefly describe the antibacterial mechanism of Sulphonamides.   | <b>(30 marks)</b> |
|          | 4.3 Draw the structure of Sulphonamide and describe its structure-activity relationship.   | <b>(50 marks)</b> |
|          |  |                   |
| <b>5</b> | 5.1 Describe the mechanism of action of cardiac glycosides.  | <b>(30 marks)</b> |
|          | 5.2 Describe the structure-activity relationship of angiotensin converting enzyme inhibitors.  | <b>(70 marks)</b> |
|          |  |                   |
| <b>6</b> | 6.1 Name the subunits found in G protein.  | <b>(20 marks)</b> |
|          | 6.2 Name three chemical molecules that influence with cAMP production.   | <b>(20 marks)</b> |
|          | 6.3 Schematically show how the signal transduction mechanism of G <sub>q</sub> pathway takes place.  | <b>(60 marks)</b> |

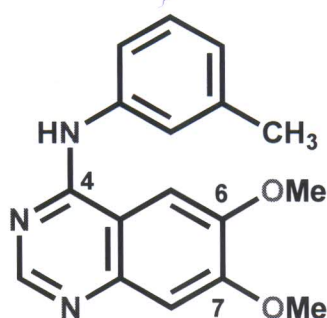
- 7 7.1 Diagram of ATP binding interaction is given below.



Describe the ATP binding interactions of the protein kinase receptor with the help of the above diagram.

(60 marks)

- 7.2



Structure 1

The structure 1 is the lead compound for the drug discovery of Gefitinib. Structure 1 is metabolised by cytochrome P450 enzymes.

6.2.1 Draw the metabolic products of the lead compound.

(20 marks)

6.2.2 Suggest a structural change to be made to prevent the metabolism.

(20 marks)

- 8 8.1 Give two examples of Farnesyl transferase inhibitors and draw its structure. (20 Marks)
- 8.2 Farnesyl transferase catalyses the attachment of farnesyl group to Ras protein. Draw the mechanism of the above reaction. (40 Marks)
- 8.3 Draw the structure of the lead compound for the Farnesyl transferase antagonist and discuss the disadvantages of that compound. (40 marks)