UNIVERSITY OF JAFFNA, SRI LANKA

BACHELOR OF PHARMACY

SECOND YEAR SECOND SEMESTER (OLD SYLLABUS) EXAMINATION – FEB 2014

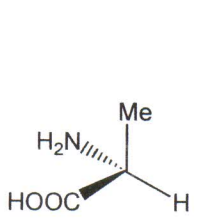
PHACH 2201 PHARMACEUTICAL CHEMISTRY II

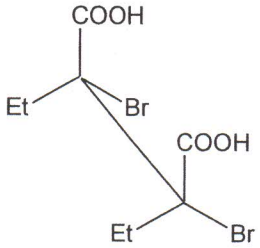
Date: 01.04.2014 **Time:3 hours**

Answer All **Six** Questions.

1.

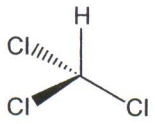
1.1 Draw the Fischer projection formulae of the following molecules.

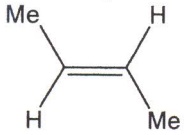




(40 Marks)

1.2 Indicate the symmetry elements present in the following molecules.





(30 Marks)

1.3 Explain the following terms.

1.3.1 Asymmetric Carbon (10 Marks)

1.3.2 Optical activity (10 Marks)

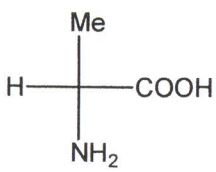
1.3.3 Enantiomers (10 Marks)

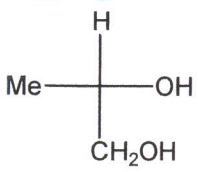
2.

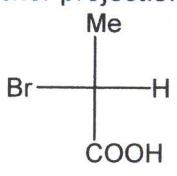
2.1 Explain the term "enantiomeric excess.An organic sample contains 5 molecules of one enantiomer for every 95 molecules of the other enantiomer. What is the enantiomeric excess of this sample? (20 Marks)

2.2 Briefly discuss the separation of racemic mixtures. (30 Marks)

2.3 Specify the configuration as **D** or **L** for the following Fischer projections.





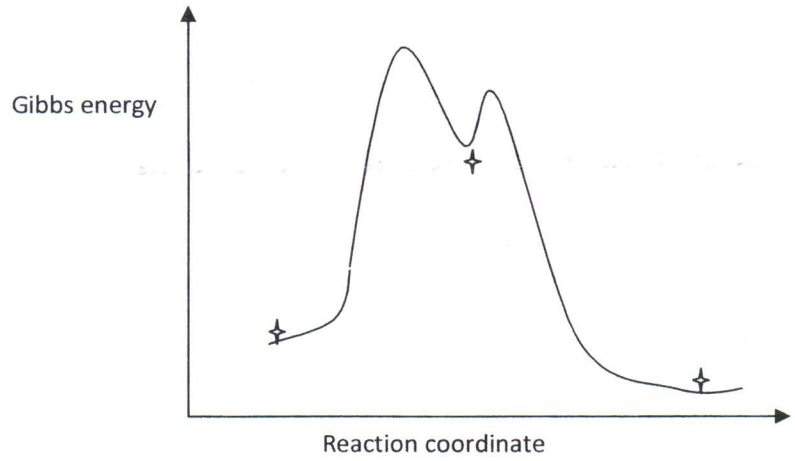


(50 Marks)

3.

3.1 An energy profile for the following nucleophilic substitution reaction is sketched below.

$$Nu^- + (CH_3)_3C\text{-}Br \longrightarrow Br^- + (CH_3)_3C\text{-}Nu$$



3.1.1 Redraw the diagram for yourself.
3.1.2 Label your diagram to show the species at the asterisks.
3.1.3 Draw in the activation energy, E_a, for the reaction.
3.1.4 Put '**TS**' in the correct places in the diagram for the transition states and predict their structures.
3.1.5 Suggest a mechanism for the given reaction.
3.1.6 Giving reason, state whether racemization would occur, if the substrate (alkyl halide) is chiral.

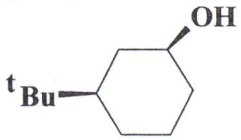
(50 Marks)

3.2 Draw the shape of a simple carbanion.
Giving reasons, arrange the following carbanions in the order of their increasing stability.

(50 Marks)

4.

4.1 Draw the possible chair conformations of the compound **H** and indicate, giving reasons, the most stable conformation. (25 Marks)



H

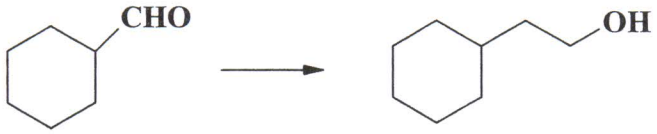
4.2 By means of reaction schemes, show how the following conversions may be effected. Give essential experimental conditions. (More than one step may be involved in each case.)

4.2.1

(i)

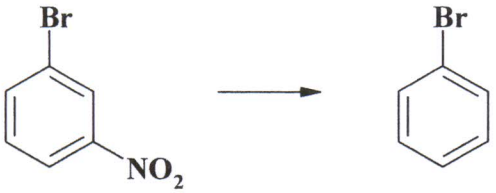
(15 marks)

(ii)



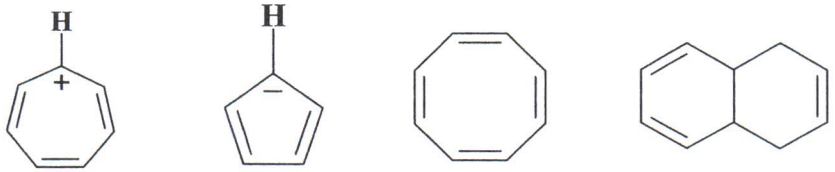
(15 marks)

(iii)



(15 marks)

4.3 State Hückel's rule for aromaticity. Giving reasons, classify the following chemical species as aromatic, anti-aromatic or non-aromatic.



(30 Marks)

5.

5.1 How will you test the purity of cyclopropane for the following substances.

5.1.1 Unsaturated substances (10 Marks)

5.1.2 Carbon dioxide (20 Marks)

5.1.3 Halogens containing substances (20 Marks)

5.2 Give the proceudure to estimate following compounds.

5.2.1 Paracetamol (20 Marks)

5.2.2 Dichlorophen (15 Marks)

5.2.3 Dicycloverine (15 Marks)

6.

6.1 Give two examples of the drugs which are phenothiazine derivatives. (10 Marks)

6.2 Give the chemical structure and the medical use of the above mentioned drugs. (30 Marks)

Sketech the route of synthesis of following drugs.

6.3.1 Metronidazle. (20 Marks)

6.3.2 Pyrazinamide. (20 Marks)

6.3.3 Tolbutamide. (20 Marks)