UNIVERSITY OF JAFFNA, SRI LANKA

BACHELOR OF PHARMACY

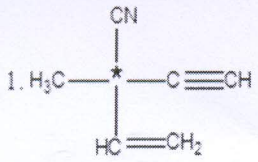
SECOND YEAR FIRST SEMESTER EXAMINATION – NOVEMBER 2014

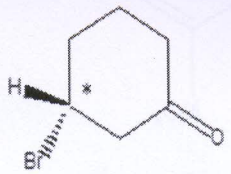
PHACH 2102 – PHARMACEUTICAL CHEMISTRY II

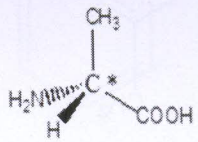
Date: 01.12.2014 **Time: 3 Hours**

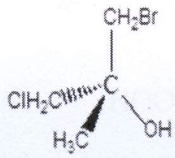
ANSWER ALL THE SIX QUESTIONS

1. 1.1 Assign R or S configuration to the indicated stereogenic centre in the following molecules. (40 Marks)

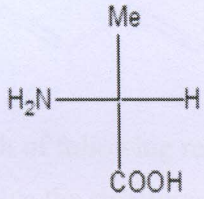
1. 

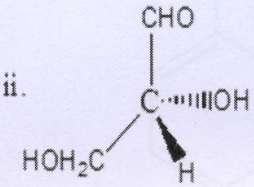
2. 

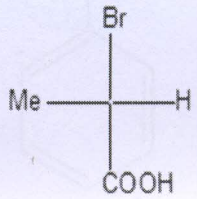
3. 

4. 

1.2 Indicate the configurations of the following weather they are D or L. (30 Marks)

i. 

ii. 

iii. 

1.3 1.3.1 Define the term "Specific rotation". (15 Marks)

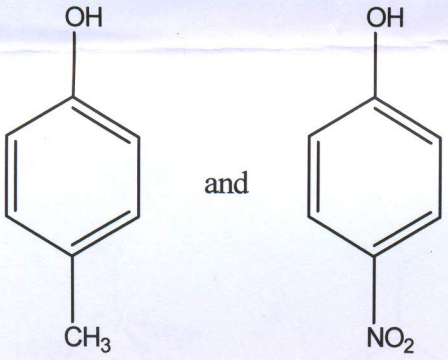
1.3.2 An organic sample (1.5g) was dissolved in 10ml ethanol and placed in a sample cell with 5 cm path length. The observed rotation at the Na D-line + 1.2^0. Calculate the specific rotation of this organic sample?

(15 Marks)

2. 2.1 Acidity of substance determined by its Ka or pKa value. Deduce the relationship for Ka and pKa. (15 Marks)

2.2 The solution of a generic weak acid (HA-0.120 M) has a pH of 3.26. Determine K_a. (25 Marks)

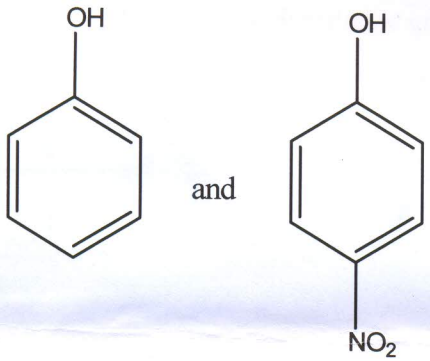
2.3 Compare each of following compounds and indicate with reasons which compound has higher pKa value.

2.3.1 

(10 Marks)

2.3.2 $(Me)_3COOH$ and $BrCH_2COOH$ (10 Marks)

2.3.3 CH_3COOH and $(Me)_2CHCOOH$ (10 Marks)

2.3.4 

(10 Marks)

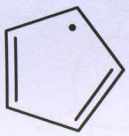
2.4 Briefly discuss about the basicity of Aniline and pyridine. (20 Marks)

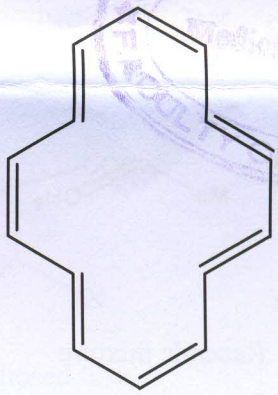
3. 3.1 Define the following term

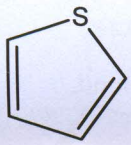
3.1.1 Aromaticity (10 Marks)

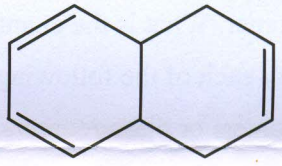
3.1.2 Conjugated system (10 Marks)

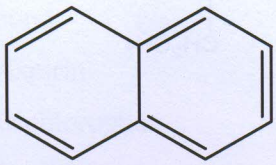
3.2 Explain with reasons, whether the following chemical species are aromatic, antiaromatic or nonaromatic. (30 Marks)

3.2.1 

3.2.2 

3.2.3 

3.2.4 

3.2.5 

3.3 For each of following reaction

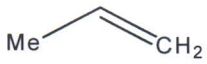
3.3.1 Give the structures of major product. (10 Marks)

3.3.2 Name the mechanism through which reaction occurs. (10 Marks)

3.3.3 Write the mechanism and give the structures of intermediates. (30 Marks)

3.3.3.1  CH_3COCl → Anhydrous $AlCl_3$

3.3.3.2  HBr →

3.3.3.3  Br_2 →

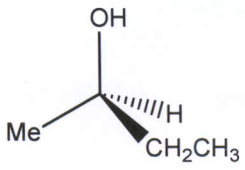
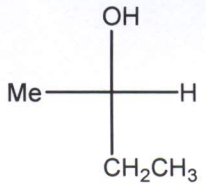
4. 4.1 Define

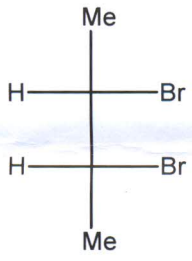
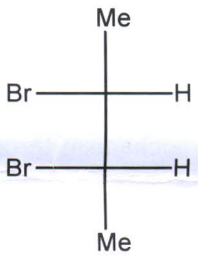
4.1.1 Racemic mixture (15 Marks)

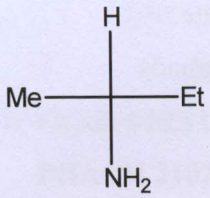
4.1.2 Enantiomers (15 Marks)

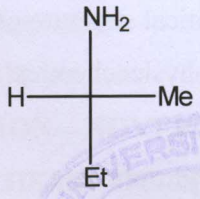
4.2 A chiral sample contains 5 molecules of one enantiomere for every 95 of other enantiomer. What is the enantiomeric excess of the sample? (10 Marks)

4.3 Classify each of the following pairs of compound as identical compound, enantiomers or diastereomers.

4.3.1  and  (10 Marks)

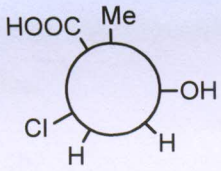
4.3.2  and  (10 Marks)

4.3.3 

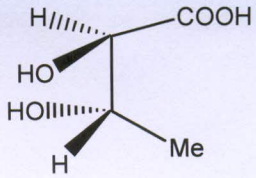
and 

(10 Marks)

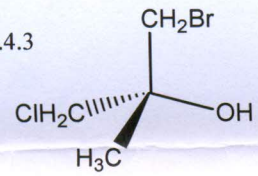
4.4 Draw the fisher projection formula for the following molecules. (30 Marks)

4.4.1 

Eclipsed form

4.4.2 

Eclipsed form

4.4.3 

Chiral compound

5. 5.1 Give the chemical structure and one of medicinal/ pharmaceutical use of follow compound.

5.1.1 Aspirin (15 Marks)

5.1.2 Dichlorophen (15 Marks)

5.1.3 Paracetamol (10 Marks)

5.1.4 Pyrazinamide (10 Marks)

5.2 Give the procedure for the assay of the following compounds.

5.2.1 Paracetamol (15 Marks)

5.2.2 Asprin (15 Marks)

5.3 Give the procedure for preparation of Phenacetin. (20 Marks)

6. 6.1 Draw the chemical structure of Glycerol and Glyceryltrinitrate. (20 Marks)

6.2 What are the physicochemical properties of following compounds

6.2.1 Glycerol (15 Marks)

6.2.2 Glyceryltrinitrate (15 Marks)

6.3 List out pharmaceutical uses of Glycerol. (20 Marks)

6.4 By means of equation show how the drugs given below are synthesised

6.4.1 Tolbutamide (15 Marks)

6.4.2 Paracetamol (15 Marks)