

08

00007

THE OPEN UNIVERSITY OF SRI LANKA
FACULTY OF HEALTH SCIENCES
DEPARTMENT OF BASIC SCIENCES



BACHELOR OF PHARMACY HONOURS- LEVEL 03 - 2018/19
BSU3341- PHARMACEUTICAL CHEMISTRY II
NBT II

DATE: 22nd August 2019

DURATION: ONE and HALF HOURS
TIME: 2.00 p.m. – 3.30 p.m.

REGISTRATION NO:

This question paper consists of 11 pages with 20 Multiple Choice Questions (Part A) and 04 Short Answer Questions (Part B).

IMPORTANT INSTRUCTIONS TO CANDIDATES

- Write your Registration Number in the space provided.
- Answer **ALL** questions.
- **Multiple Choice Questions (Part A):** Indicate answers in the answer sheet provided by placing a cross (X) in **INK** in the relevant cage.
- Answers in pencil will **NOT** be marked.
- **Short Answer Questions (Part B):** Write answers within the space provided.
- Do not remove any page/part of this question paper from the examination hall.
- Mobile phones and the electronic equipment are **NOT** allowed. Leave them outside.

BACHELOR OF PHARMACY HONOURS- LEVEL 03 - 2018/19
BSU3341- PHARMACEUTICAL CHEMISTRY II
NBT II

REGISTRATION NO:

ANSWER SHEET FOR PART A

Q. No.	(a)	(b)	(c)	(d)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				



BACHELOR OF PHARMACY HONOURS- LEVEL 03 - 2018/19
 BSU3341- PHARMACEUTICAL CHEMISTRY II
 NBT 02

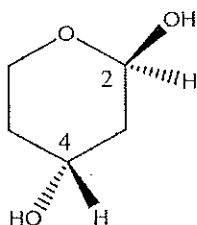
REGISTRATION NO:

Part A – Multiple Choice Questions

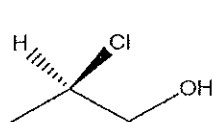
(40 marks)

Choose the most suitable answer and indicate with a 'X' in the answer sheet provided.

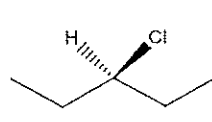
- Which one of the following statements is correct regarding conformations?
 - Conformers can be interconverted by rotation of C-C sigma bond
 - Conformers can be isolated at room temperature
 - For ethane, the eclipsed conformation is the most stable
 - For butane, the staggered anti conformation is the least stable
- Which is the correct assignment of chirality at C2 and C4 of the following molecule?



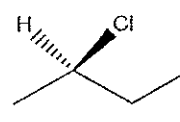
- 2S, 4S b) 2R, 4S c) 2S, 4R d) 2R, 4R
- Compound Q and R are stereoisomers. They are nonsuperimposable and are mirror images of one another. Which of the following best describes the relationship between Q and R?
 - Structural isomers
 - Diastereomers
 - Enantiomers
 - Conformational isomers
 - Which of the following compound is achiral?



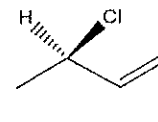
a)



b)



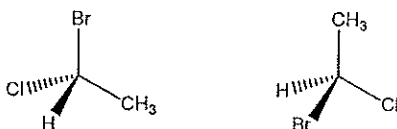
c)



d)



5. What term describes the structural relationship between cis-1, 2-dibromopentane and trans-1, 2-dibromopentane?
- Conformers
 - Enantiomers
 - Diastereomers
 - Not isomers
6. Hexane and 2, 2-dimethylbutane are example of:
- Enantiomers
 - Stereoisomers
 - Constitutional isomers
 - None of these
7. What term describes the structural relationship between (2R, 4S)-2, 4-dibromopentane and (2S, 4R)-2, 4-dibromopentane?
- Enantiomers
 - Diastereomers
 - Identical
 - Conformers
8. Which of the following is **not** true of enantiomers?
- They have the same boiling point
 - They have the same melting point
 - They have the same reactivity toward chiral resolving agents
 - They rotate the plane of plane-polarized light in the same direction
9. An unknown sample shows a specific rotation of $+9.92^{\circ}$. Which one of the following is true regarding the compound?
- The compound has the (S) configuration
 - The compound has the (R) configuration
 - The optical purity of this sample is less than 100%
 - This is not a meso compound
10. The compounds shown below are,



- Enantiomers
- Diastereomers
- Identical
- Constitutional isomers



16. When a carbocation is formed during an S_N1 reaction, it can undergo a rearrangement process to form a more stable carbocation. Which of the following compounds is most likely to undergo such rearrangement in an S_N1 reaction?
- 3-bromopentane
 - 2-bromo-3, 3-dimethylpentane
 - Chloropentane
 - Bromo cyclohexane
17. If the concentration of the nucleophile is doubled in a reaction which proceeds through S_N1 mechanism, the reaction rate will:
- remain the same
 - double
 - triple
 - cannot predict
18. Which of the following shows the highest nucleophilicity in polar protic solvents?
- a) Cl^- b) Br^- c) F^- d) I^-
19. Which of the following statement is **incorrect**?
- The S_N2 reactions proceed with inversion of configuration
 - The S_N1 reactions take place in two steps
 - The S_N2 reactions follow second-order kinetics
 - A 50% inversion of configuration takes place in S_N2 reactions.
20. The rate of an $E1$ reaction depends upon:
- the concentration of nucleophile
 - the concentration of substrate
 - the concentrations of both nucleophile and substrate
 - the solvent



BACHELOR OF PHARMACY HONOURS- LEVEL 03 - 2018/19
 BSU3341- PHARMACEUTICAL CHEMISTRY II
 NBT II

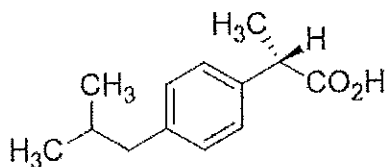
REGISTRATION NO:

Part B –Short Answer Questions

(60 marks)

Write answers in the space provided.

1. a). Ibuprofen is a non-steroidal anti-inflammatory drug (NSAID) originally marketed as Brufen. The structure (A) given below is one of the stereoisomers of Ibuprofen. Draw the structure of its enantiomer in the space provided. (05 marks)



(A)

- b). Determine the configuration of the stereocenter of A. (Make sure to indicate the priority order of groups as well). (05 marks)

- c) A sample of synthesized Ibuprofen showed a specific rotation ($[\alpha]_D$) of $+6.76^\circ$. The $[\alpha]_D$ of (+) -(S)- Ibuprofen is $+13.52$.
 I. Calculate the percent optical purity of (+)-(S)- Ibuprofen. (04 marks)



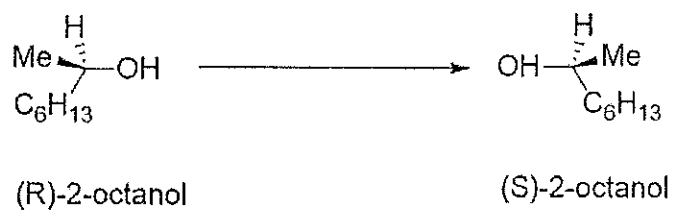
- II. Calculate the Enantiomeric excess of (+)-(S)- Ibuprofen. (02 marks)
- III. Calculate the percent of (+)-(S)- Ibuprofen in the sample. (04 marks)
2. Draw Newman projection diagrams to show staggered and eclipsed conformations of butane when the C2-C3 bond is rotated through 360° . Indicate the most stable conformation(s). (15 marks)



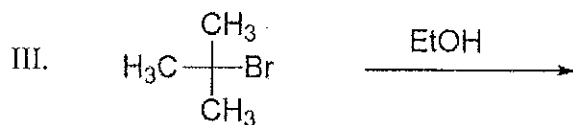
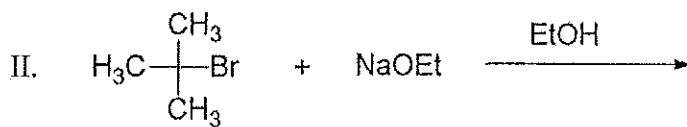
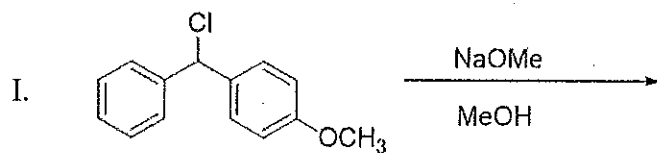
3. The rate of hydrolysis of *tert*-butyl chloride (2-chloro-2-methylpropane) in water is unaffected by the addition of a small amount of NaOH. Comment on this statement providing the mechanism of the reaction. (10 marks)



4. a) How would you carry out the following transformation? (05 marks)



b) Predict the major product(s) of the following reactions and specify whether the reaction is S_N1 , S_N2 , E1 or E2. (10 marks)



Reg No:.....

Name:.....

Address:.....

.....

.....

.....



