

# C.U.SHAH UNIVERSITY

## Summer Examination-2016

Subject Name : Stereochemistry in Organic Synthesis

Subject Code : 4SC02SOS1 /4LS02CHM1

Branch: B.Sc. (Microbiology)

Semester : 2

Date : 09/05/2016

Time : 10:30 To 01:30

Marks : 70

Instructions:

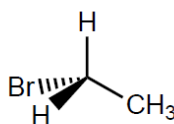
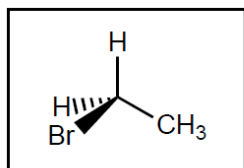
- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

Q-1

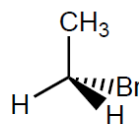
Attempt the following questions:

(14)

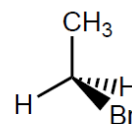
- a) Which is the enantiomer of the following compound? (1)



I



II



III

A. I

B. II

C. III

D. All

- b) What is the reactive intermediate formed in Riemer – Tiemann reaction? (1)

A. Carbocation

B. Carbene

C. Free radical

D. Carbocation

- c) Which of the following physical properties differs for each of a pair of enantiomers? (1)

A. Solubility in ethanol

B. Direction of rotation of plane-polarized light

C. Boiling point and melting point

D. Index of refraction

- d) Which of the following carbocation is the most stable? (1)

A. Allyl

B. Methyl

C. Vinyl

D. Benzyl

- e) Rate of change in concentration of reactant and product with time is called: (1)

A. Order of reaction

B. Rate of reaction

C. Molecularity of reaction

D. Activation energy

- f) The distance from the nucleus of the atom to the outermost electron is called: (1)

A. Van der Waals radius

B. Bond angle

C. Atomic radius

D. Bond length

- g) Which of the following amine have highest basicity? (1)

A.  $\text{NH}_3$

B.  $\text{CH}_3\text{NH}_2$

C.  $(\text{CH}_3)_2\text{NH}$

D.  $(\text{CH}_3)_3\text{N}$

- h) What is Hoffmann rule? (1)

- i) What is inductive effect? (1)

- j) What is Saytzeff rule? (1)



- k) Give example of meso compound. (1)
- l) Give example of tautomerism. (1)
- m) Write definition of enantiomerism. (1)
- n) Give name of reagents for halogenations of benzene. (1)

**Attempt any four questions from Q-2 to Q-8**

- Q-2 Attempt all questions (14)**
- a) What are different reactive intermediates formed during an organic reactions? Explain the hybridization and geometry of each reactive intermediate. (7)
  - b) Draw the reaction scheme and explain different steps involved in the reaction mechanism of Friedel-Crafts acylation of benzene. (7)
- Q-3 Attempt all questions (14)**
- a) Explain classification of organic reactions. What is the biological importance of radical reaction? (7)
  - b) What are the differences between  $SN^1$  and  $SN^2$  reaction mechanism? (7)
- Q-4 Attempt all questions (14)**
- a) Write a note on effect of substituent on acidic strength of carboxylic acids? (7)
  - b) Explain  $SN^1$  and  $E1(CB)$  reaction mechanism with suitable example. (7)
- Q-5 Attempt all questions (14)**
- a) Discuss the basic criteria for aromaticity and antiaromaticity with suitable example. (7)
  - b) What is hybridization? Explain  $sp^2$  hybridization with suitable example. (7)
- Q-6 Attempt all questions (14)**
- a) Explain different methods for representation of conformational isomers. (7)
  - b) Write a note on hyperconjugation. (7)
- Q-7 Attempt all questions (14)**
- a) What is resonance effect? Explain delocalization of  $\pi$  electrons through  $\pi-\pi$  and  $p-\pi$  overlap. (7)
  - b) Explain with example different steps involved in assigning R,S nomenclature to organic compounds. (7)
- Q-8 Attempt all questions (14)**
- a) Discuss the method for resolution of enantiomers. (7)
  - b) How many stereoisomers are possible for organic compound having n stereocentre? Draw all possible stereoisomers of 2-bromo-3-chlorobutane. (7)

