

CVM UNIVERSITY

Total Printed Pages: 03

M. Sc. (Organic Chemistry) Semester-1 Examination-2021

Wednesday 24th February-2021

10:00 AM to 12:00 PM

101330102: ORGANIC CHEMISTRY-I

Note: (1) Attempt all questions.

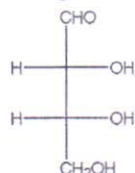
Total Marks: 60

(2) Figures to the right indicate marks.

Q-1[A] Answer the following multiple-choice questions.

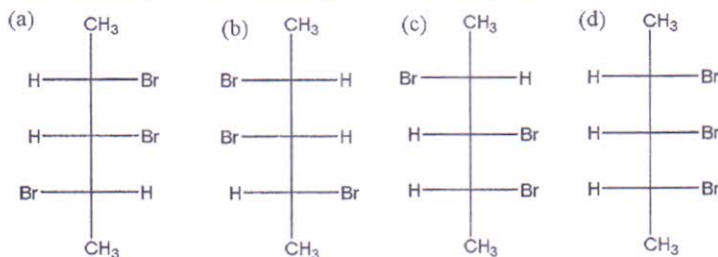
[08]

1. The configuration of chiral center in the given molecule is _____.



- (a) 2S,3S (b) 2S,3R (c) 2R,3S (d) 2R,3R

2. In which of the isomer, C-3 is a chirotopic and stereogenic?



3. Which of the following conditions favours Saytzeff elimination?
(a) formation of least substituted alkene
(b) Increase in bulk of substrate
(c) Presence of groups at α and β carbon which can stabilize the developing double bond
(d) Higher base strength
4. Conversion of alkene to aldehyde or ketone is occurs in _____ reaction.
(a) hydration (b) ozonolysis (c) hydroxylation (d) halogenation
5. Which one of the following is *NOT* correct for σ -complex?
(a) Actual bond formation occurs (b) It can conduct electricity
(c) Significant change is observed in UV spectra (d) It doesn't change colour
6. In electrophilic aromatic substitution reaction nitro group exert _____.
(a) activated and *m*-directing (b) deactivated and *m*-directing
(c) deactivated and *o*- & *p*-directing (d) activated and *o*- & *p*-directing
7. Which of the following is most stable carbocation?
(a) 3^o carbocation (b) 2^o carbocation (c) 1^o carbocation (d) methyl cation

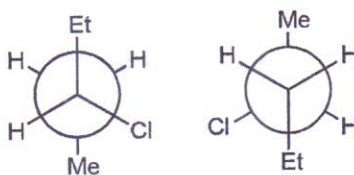
[P.T.O.]

8. Benzaldehyde upon Bayer-Villiger oxidation gives _____.
 (a) Acetanilide (b) Benzophenone (c) Benzoic acid (d) Benzoxazole

Q-1[B] Answer the following (Fill in the blanks and True or False).

[08]

1. The pair of structures given below represents _____. (positional isomers / enantiomers)



2. In 2,3-butane diol, _____ stereoisomers are possible. (four / three)
 3. Reaction of KMnO_4 with alkene is occurs in anti-manner. **True or False ?**
 4. Electron withdrawing group must be present on $\text{C}=\text{C}$ (double bond) in nucleophilic addition to alkene. **True or False ?**
 5. Atom or group of atoms having deficiency of electron is known as _____. (electrophile / nucleophile)
 6. _____ group has highest migratory aptitude in Beckmann Rearrangement. (H-atom / 3° -alkyl group)
 7. Hydrochlorination of benzene is processed through _____ reaction. (addition / substitution)
 8. Br-OH is used for bromination. **True or False ?**

Q-2 Attempt Any SIX of the following

[12]

1. Give the minimum requirements of chirality for
 (a) Ansa Compound (b) Paracyclophanes
 2. Show that optically active compound upon saponification loses its optical activity.
 3. Complete the reaction and justify your answer.

$$\text{H}_2\text{C}=\text{CH}-\text{Br} \xrightarrow{\text{HBr}} \text{Major} + \text{Minor}$$

 4. Give the proof for involvement of carbene intermediate in α - elimination.
 5. Show the easiest way for synthesizing ethylbenzene from benzene.
 6. "Even though $-\text{NH}_2$ group in electrophilic substitution reaction is *o*- & *p*-directing, aniline upon nitration gives *m*-isomer." Why?
 7. Define the terms 'Electrophile' and 'Nucleophile' and give two examples of each.
 8. Give the synthesis of dibenzal acetone from benzaldehyde and acetone.

Q-3 (A) Discuss the limitation and advantages of Fisher projection formula by taking suitable example.

[08]

(B) Give the example of following and assign the configuration of each of them.

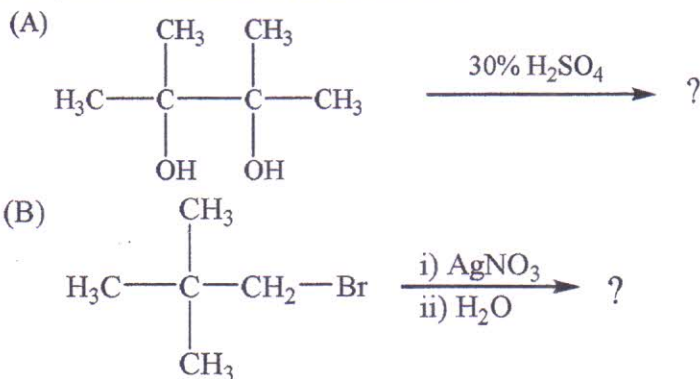
- (i) Pseudochiral Faces (ii) Pseudochiral Center
 (iii) Prochiral Center (iv) Enantiotopic Faces

[P.T.O.]

OR

- Q-3 (A) Discuss the classification of homomorphous ligands by giving different appropriate examples. [08]
(B) "Chirality is the geometric property of whole molecule and does not depend on individual atoms." Justify the statement.

- Q-4 Complete the reactions with mechanism. [08]



OR

- Q-4 Explain the following rearrangements in detail. [08]
(A) Benzil-Benzilic acid rearrangement
(B) Favorskii rearrangement

- Q-5 Answer the following. [08]
(A) "Any increase in bulk of substrate will form Hoffmann product." Explain this using suitable example.
(B) Explain the role of temperature in electrophilic addition reaction of diene.

OR

- Q-5 Justify the following statements. [08]
(A) "Cope reaction is more favourable than Chugaev reaction."
(B) "The reaction of alkene with KMnO_4 is stereospecific reaction."

- Q-6 Discuss the following. [08]
(A) Sulphonation of naphthalene.
(B) Friedel-Craft alkylation with its limitations.

OR

- Q-6 Answer the following. [08]
(A) Give the synthesis of anthraquinone from phthalic anhydride.
(B) Discuss nitration of toluene and nitrobenzene.

ALL THE BEST