

FB-139

February-2025

M.Sc., Sem.-I

**402 : Chemistry
(Organic Chemistry)**

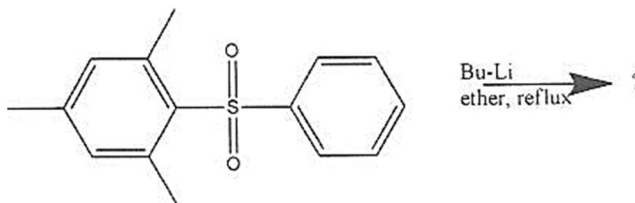
Time : 2:30 Hours]

[Max. Marks : 70

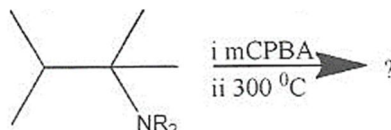
- Instructions :** (1) All questions carry equal marks.
(2) All questions are compulsory.

1. Answer the following questions : 14

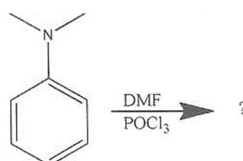
- (i) (A) *meso*-2,3-dibromobutane in presence of iodide ion gives trans-2-butene, whereas d/l pair give cis-2-butene—Explain.
(B) Identify the following reaction and complete giving mechanism :



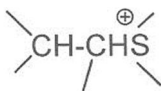
- (ii) (A) In alkaline medium trans-2-chlorocyclohexanol forms epoxide more readily than its cis isomer—Explain.
(B) Identify the following reaction and complete giving mechanism :

**OR**1. Answer the following questions : 14

- (i) (A) *alpha*-Bromopropionic acid on treatment with dilute alkali forms a substituted product with complete retention of configuration—Explain :
(B) Identify the following reaction and complete giving mechanism.



- (ii) (A) Following substrate under E1 elimination conditions favours Saytzeff's product. Justify giving mechanism.



- (B) Compare E1 & E2 mechanism.

2. Answer the following questions : 14

- (i) Discuss aromaticity in anulenes.
- (ii) (A) Discuss three important application tools of Microsoft office with their characteristics uses.
- (B) Give three important uses of template option available in side panel of Chem Draw.

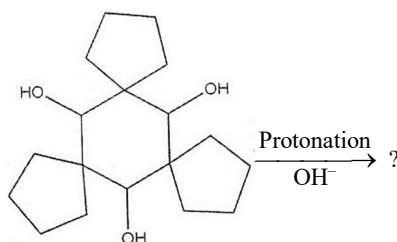
OR

2. Answer the following questions : 14

- (i) Using frost circle diagram, determine aromatic and anti-aromatic character of cyclobutadiene and benzene.
- (ii) (A) Write a note on important websites used for data search in chemistry.
- (B) Give brief overview of search engines used in chemistry.

3. Answer the following questions : 14

- (i) (A) Give principle, reaction mechanism and an application of Favorskii rearrangement.
- (B) Complete the following reaction with mechanism :



- (ii) Give structure, hybridization, any three preparations and stability of free radicals.

OR

3. Answer the following questions : 14
- (i) (A) Give principle, reaction mechanism and an application of Fries rearrangement.
- (B) Complete the following reaction with mechanism :
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- (ii) Write a note on Carbenes and Nitrenes.
4. Answer the following questions : 14
- (i) (A) Give two important conditions for diphenyls to be optical activity.
- (B) Define Cram's rule. Show distereotopy in it with nomenclature.
- (ii) Write a note on chiral chromatography.
- OR**
4. Answer the following questions : 14
- (i) (A) Discuss stereoselectivity and stereospecificity in reaction of 2-bromobutane with OH^- .
- (B) Discuss stereochemistry of Diel's Alder in [4+2] addition reaction.
- (ii) Discuss Dynamic kinetic resolution.
5. Answer any **seven** out of **twelve** questions in short : 14
- (1) Give name and chemical reaction used for formylation of benzene.
 - (2) Give the conditions that increases Hoffmann product over Satzef's product.
 - (3) Give chemical reaction for Burgess reaction.
 - (4) Draw an isomeric benzene fulvene structure, and show whether it is aromatic or not.
 - (5) Draw a structure of Cyclooctatetrene and say is aromatic or not.
 - (6) Write the steps followed to find out physical properties in Chem Draw software.
 - (7) Give the structure and IUPAC name of the product which is obtained when acetophenone reacts with HN_3 in presence of acidic medium.

- (8) Give two methods to generate carbanion.
 - (9) Give Principle of Steven rearrangement.
 - (10) Give difference between conformation and atropisomerism.
 - (11) Define Chiral toxicity in drug. Give one example.
 - (12) What is kinetic resolution of stereoisomers ? Give one example.
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