

Roll No. :

Total No. of Questions : 11]

[Total No. of Printed Pages : 3

BFMS-424

M.Sc. (Final) Examination, 2023

CHEMISTRY

Paper - VIII (A)

(Group-B CH-505)

(Organic Synthesis)

Time : 3 Hours]

[Maximum Marks : 75

Section-A

(Marks : 2 × 10 = 20)

Note :- Answer all *ten* questions (Answer limit 50 words). Each question carries 2 marks.

Section-B

(Marks : 5 × 5 = 25)

Note :- Answer all *five* questions. Each question has internal choice (Answer limit 200 words). Each question carries 5 marks.

Section-C

(Marks : 10 × 3 = 30)

Note :- Answer any *three* questions out of five (Answer limit 500 words). Each question carries 10 marks.

Section-A

1. (i) What is Reformatsky Reaction ?

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(1)

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- (ii) Grignard reagents give 1, 2-addition reaction with α , β -unsaturated carbonyl compounds but in presence of CuCl or CuBr they give 1, 4-addition reaction. Explain.
- (iii) Discuss oxidation of ketone with suitable example.
- (iv) Give mechanism of reduction of carboxylic acids using LiAlH_4 .
- (v) What are the salient features of protecting group ?
- (vi) Define the term functional group interconversion (FGI) and disconnection used in organic synthesis.
- (vii) Give *two* uses of acetylenes in organic synthesis.
- (viii) Give *one* method of preparation of 4-membered ring.
- (ix) Write the structure of Vitamin D.
- (x) There are two dissimilar chiral centres in camphor but only one pair of enantiomers is known. Explain.

Section-B

2. Explain nucleophilic addition reactions of Grignard Reagents.

Or

Give synthesis and important reactions of Gilman Reagents.

3. Discuss oxidation of activated C-H group by taking examples of allylic systems and benzylic systems.

Or

Name various rearrangements to electron deficient nitrogen. Discuss Beckmann Rearrangement.

4. Explain the importance of protecting groups in organic synthesis. Discuss the important methods employed for protection of carboxyl group.

Or

Discuss one group C-X disconnections with suitable examples.

5. What do you mean by Regioselectivity ? Discuss regioselectivity in Michael reactions and Diels-Alder reactions.

Or

Discuss the use of aliphatic nitro-compounds in organic synthesis.

6. Discuss Retrosynthetic analysis of Cortisone.

Or

Discuss the synthesis of Vitamin D.

Section-C

7. Discuss synthetic applications of metal carbonyl complex of Fe and Ni.
8. Discuss the following :
- (a) Pinacol-Pinacolone rearrangement
 - (b) Hydrogenolysis
9. What is Disconnection Approach ? Discuss the guidelines for choosing suitable disconnection.
10. With the help of suitable examples discuss the following common processes by which heterocycles have demonstrated their synthetic powers :
- (i) Destruction of aromaticity
 - (ii) Drive towards aromaticity
 - (iii) Release of ring strain
 - (iv) Temporary formation of a heterocyclic intermediate
 - (v) Modification and elaboration of synthetically useful heterocycles.
11. Describe the total synthesis of camphor.