25025222

QP CODE: 25025222

Reg No : .....

Name : .....

M.Sc DEGREE (CSS) EXAMINATION, MAY 2025

Second Semester

CORE - CH500202 - ORGANIC REACTION MECHANISMS

M Sc CHEMISTRY, M Sc POLYMER CHEMISTRY, M Sc ANALYTICAL CHEMISTRY, M Sc APPLIED CHEMISTRY, M Sc PHARMACEUTICAL CHEMISTRY

2019 ADMISSION ONWARDS

90CFD227

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Good leaving group is preferred for both SN1 and SN2 reactions. Why?
2. Draw the mechanism for the formation and a reaction of a lithium enolate.
3. Draw the mechanism of Pinacol-pinacolone rearrangement.(No explanation is required)
4. Among iodolactonisation and chlorolactonisation, which is more efficient? Justify your answer.
5. What are nitrenes? Why nitrenes are more stable than carbenes?
6. Benzamide on treatment with Br_2 and alkali undergoes Hoffmann Rearrangemnt but N-methylbenzamide does not. Explain why?
7. Discuss Baldwin's rules.
8. Discuss the structure of α, β- unsaturated carbonyl compounds.
9. Explain Cheletropic reaction using suitable example.
10. What is Cope elimination? Illustrate with an example.

(8×1=8 weightage)

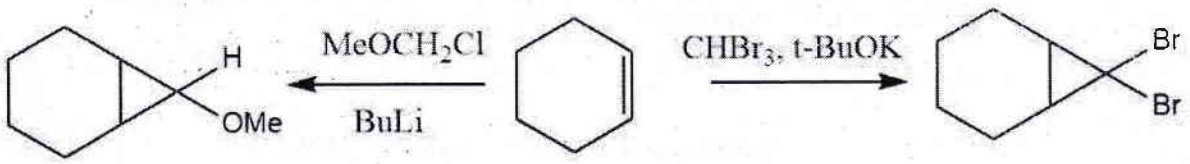
Part B (Short Essay/Problems)

*Answer any **six** questions.*

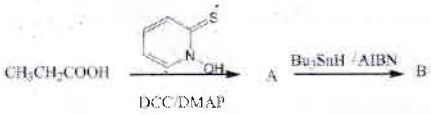
*Weight **2** each.*

11. Compare E1 and E2 mechanisms.
12. Draw the mechanism of Stobbe and acyloin condensations .Write salient features of both reactions.
13. Differentiate between classical and non-classical carbocations.

14. Suggest mechanisms for these reactions.

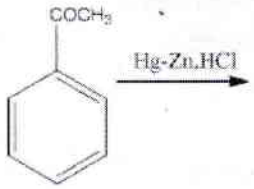


15. Indicate the products A and B of the reaction and explain the mechanism.



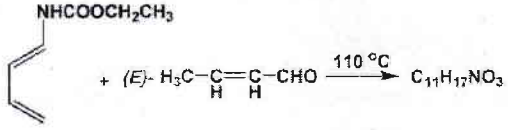
16. Complete the following reactions. Show the steps in the mechanism of reaction.

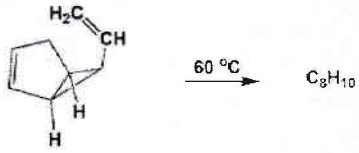
a) $CH_3CH{=}CH{-}CHO \xrightarrow{Ag(NH_3)_2OH}$

b) 

17. Explain Mislow-Evans and Sommelet-Hauser rearrangements with suitable examples.

18. Predict the products of the following reactions on the basis of the reaction mechanism and anticipated transition structure with correct stereochemistry.

a) 

b) 

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. Draw the mechanisms for SN1, SN2, SNi, SE1 and SE2 reactions. Briefly mention their salient features.

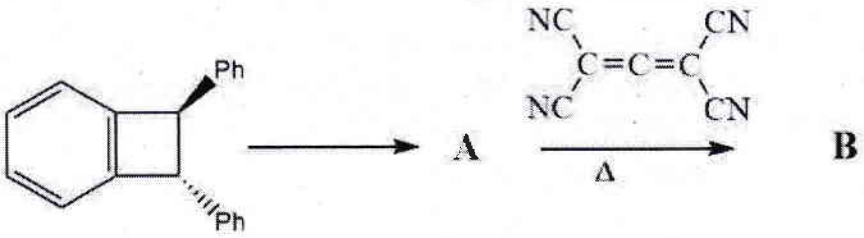
20. How do the following observations support the benzyne mechanism?(a) *o*-bromoanisole reacts with $NaNH_2/NH_3$ to form *m*-anisidine (b) Chlorobenzene with Cl bonded to ^{14}C gives almost 50% aniline having NH_2 bonded to ^{14}C and 50% of aniline with NH_2 bonded to ortho carbon. (c) Compounds lacking ortho hydrogen (eg. 2,6-dimethylchlorobenzene) do not react with $NaNH_2/NH_3$ (d) 2,6-dideuterobromobenzene reacts more slowly than bromobenzene.

21. Discuss briefly a)Aldol condensation b)Cannizzaro reaction, c)Grignard reagent addition to carbonyl compounds with examples and applications

22. (i) Reduction of alkene or alkyne with diimide is an example of group transfer reaction. Give mechanism and stereochemistry of the reaction.

(ii) In what way ene reaction is related to Diels-Alder reaction, explain it with relevant examples and mechanism.

iii) Complete the given reaction sequence and give the mechanism of each step.



(2×5=10 weightage)