

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI-86
(For candidates admitted from the academic year 2019-20 & thereafter)

SUBJECT CODE: 19CH/PC/OC24

M. Sc. DEGREE EXAMINATION, APRIL 2023
BRANCH IV- CHEMISTRY
SECOND SEMESTER

COURSE : CORE

PAPER : ORGANIC CHEMISTRY – II

TIME : 3 HOURS

MAX. MARKS: 100

SECTION – A

Answer all the questions.

(20 x 1= 20)

I Choose the correct answer:

- Which of the following alkyl halide will form tertiary alcohol on reaction with $\text{H}_2\text{O}/\text{H}^+$?
a) 2-bromo-2-methylbutane b) 2-bromo-3-methylbutane
c) 2,2-dimethyl-1-bromopropane d) all of these
- The condensation of acetaldehyde with HCHO in the presence of NaOMe forms_____.
a) 3-hydroxypropanal b) 3-hydroxypropanal
c) Ethanoic acid & Methanol d) Ethanol & formic acid
- In the reduction reaction of 4-*t*-butylcyclohexanone by LiAlH_4 , the *endo* approach of the reagent forms _____ as the major product.
a) *cis*-4-*t*-butylcyclohexanol b) *trans*-4-*t*-butylcyclohexanol
c) Both (a) & (b) d) non-stereospecific product
- The photolysis of 2-hexanone forms_____.
a) Propene + propanone b) Ethene + 2-butanone
c) ethene + butanoic acid d) cyclohexanone
- Conversion of 3-phenyl-1,5-hexadiene to 3-phenyl-1,5-hexadiene under thermal condition is an example of _____rearrangement.
a) Cope b) Oxy Cope c) Claisen d) None of these

II Fill in the blanks:

- The key intermediate formed in the Hofmann rearrangement is _____.
- The product formed in the amination reaction of pyridine is _____.
- $(\text{COCl})_2$ in DMSO is called as _____.
- The photolysis of an alkyl nitrite to form a δ -nitroso alcohol is _____ reaction.
- The product formed between the reaction of cyclopentadiene and *p*-benzoquinone is _____.

III State whether true or false:

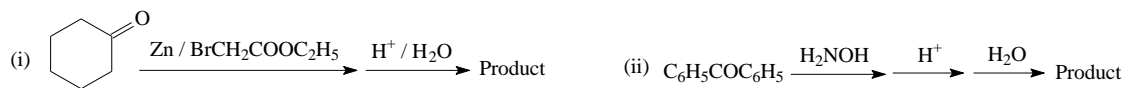
11. Ylides derivatives are carbon nucleophiles.
12. Hydroboration of propene follows anti Markovnikovs' addition.
13. LDA is a non-nucleophilic base.
14. Photo oxidation of olefin forms peroxide derivatives as major product.
15. Oxy-Cope rearrangement is an example of sigmatropic reaction.

IV Answer in a line or two:

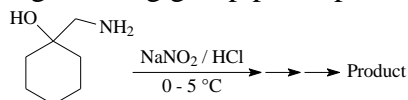
16. Why are carbene additions to olefin non-stereospecific in gas phase?
17. Mention the key intermediate formed in the Fries rearrangement.
18. What is Jones reagent?
19. Write the Woodward Hoffmann rules for electrocyclization reaction.
20. Give an example for chelotropic reaction.

SECTION – B**ANSWER ANY FIVE QUESTIONS:****(5x8=40)**

21. Predict the product and justify your answer with suitable mechanism. (4 +4)



22. a) Apply neighbouring group participation principle and identify the product. (4)

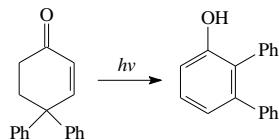


- b) Write the coupling reaction of benzophenone in presence of $TiCl_4 / Zn(Cu)$. (4)

23. a) Explain Shapiro reaction using suitable example. (5)
b) Mention the role of KOH in the Reimer-Tiemann reaction. (3)

24. How are *cis* and *trans* diols synthesised from olefins by Woodward and Prevost Hydroxylation methods? (8)

25. a) Effect the following conversion with suitable mechanism. (5)



- b) What is Norrish type II reaction? (3)

26. Explain the following with suitable examples. (4 + 4)
a) Paterno-Buchi reaction of alkenes b) Claisen rearrangement ..3

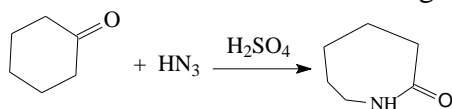
27. Draw correlation diagram for the cycloaddition of 1,3-butadiene and ethylene. Predict whether the reaction is thermally or photochemically allowed.

SECTION – C

ANSWER ANY TWO QUESTIONS:

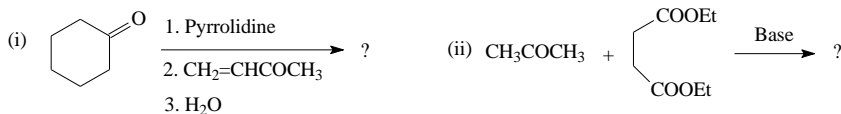
(2x20=40)

28. a) Explain acyloin condensation reaction with suitable mechanism. (6)
 b) Predict the product for the reaction of benzamide with Br₂/ NaOH. (5)
 c) Suggest suitable mechanism for the following conversion. (5)

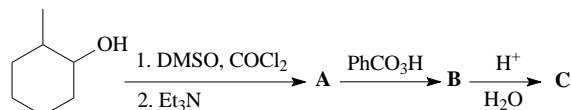


- d) Give the reaction of ethylacetate with 2 moles of methylmagnesium bromide. (4)

29. a) Predict the product and justify your answers with suitable mechanism. (5+5)



- b) Explain the reaction between anisole and Birch reagent with suitable mechanism. (5)
 c) Identify A, B & C. (2 + 2 + 1)



30. a) Explain Barton reaction mechanism with suitable example. (6)
 b) Give an example for [1,3] and [1,5]-sigmatropic rearrangement reactions. Predict the stereochemistry of their final products with the help of FMO diagrams. (8)
 c) Explain Cope rearrangement using divinylcyclopropane as substrate. (6)
