

Reg. No. :

Name :

Second Semester M.Sc. Degree Examination, September 2022

Chemistry/Polymer Chemistry/Analytical Chemistry

CH/CL/PC 222 : ORGANIC CHEMISTRY – II

**(Common for Chemistry/Analytical Chemistry (2016-2019 Admission) and
Polymer Chemistry (2018 and 2019 Admission))**

Time : 3 Hours

Max. Marks : 75

SECTION – A

Answer **any two** among (a), (b) and (c) from each questions. Each sub-questions carries **2** marks.

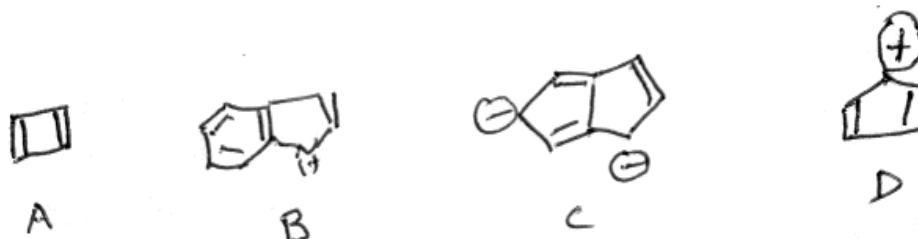
- Nitro methane is deprotonated in the presence of a strong base. Write the resonance structures of the resulting carbanion.
 - What do you understand by free energy change (ΔG°) of a reaction? What can be predicted about the equilibrium from a knowledge of ΔG° .
 - State the principle of microscopic reversibility.
- What is Orton rearrangement reaction?
 - Formulate the following. Name the reaction and outline the mechanism



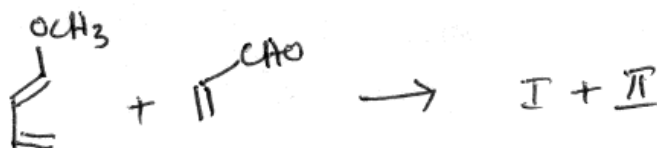
1, 2 aminoalcohol

- What is Wolf rearrangement reaction?

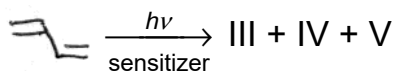
3. (a) On the basis of Huckel's rule label the following molecules A to D as aromatic or anti-aromatic.



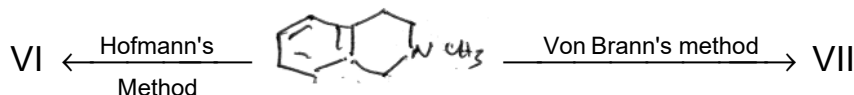
- (b) Formulate the following : Which one is a major product?



- (c) In the thermal ring opening of trans-3,4-dimethyl cyclobutene, two products can be formed by conrotatory mode, but only one is actually obtained. Identify the possible products. Which one is actually obtained and why?
4. (a) Write the structures and mechanism of formation of products from the irradiation of cyclopentanone.
- (b) What is Di- π – methane rearrangement?
- (c) Formulate the following



5. (a) Formulate the following :



- (b) What is Barbier-Wieland degradation? Explain.
- (c) How would you synthesize 7-hydroxy flavone by Baker-Venkataraman method?

(10 × 2 = 20 Marks)

SECTION – B

Answer either (a) or (b) of each questions, and each question carries **5** marks.

6. (a) Write a note on Hammett equation and its applications.
(b) Explain the concept of thermodynamic and kinetic control of a reaction using the example of an unsymmetrical ketone.
7. (a) Outline the synthesis of $C_6H_5 \cdot COOCH_3$ from acetophenone by Baeyer-Villiger rearrangement. Outline its mechanism.
(b) The compound (A) shown below can be synthesized from (B) as well as from (C) using alkoxide. Name the reaction and propose mechanism.
- (A) $C_6H_5CH_2CH_2COOR$
(B) $C_6H_5CH_2 \cdot COCH_2Cl$
(C) $C_6H_5CH(Cl) - COCH_3$
8. (a) Write down the Woodward-Hoffmann rules (Selection rules) for electrocyclic reactions.
(b) What is an oxy-cope rearrangement? Give an example.
9. (a) Write notes on Parerno-Buchi reaction.
(b) Explain photo Fries rearrangement. How does it differ from thermal Fries rearrangement?
10. (a) Outline the synthesis of the following :
Queraetin by Kostanecki method.
(b) Give a brief note on Biosynthesis of Tepenoids.

(5 × 5 = 25 Marks)

SECTION – C

Answer **any three** questions and each question carries **10** marks.

11. Explain in detail about phase transfer catalysis and its applications in organic synthesis.
12. Give a brief account on rearrangement reactions going through
 - (a) Rearrangement to Electron deficient carbon
 - (b) Rearrangement to Electron deficient nitrogen.(one example for each category with mechanism)
13. With the help of symmetry properties of the molecular orbitals of cyclohexadiene show that why its con-rotatory conversion to 1,3,5-hexatriene is a thermally forbidden.
14. Describe the photo reactions of carbonyl compounds, dienes and arenes.
15. Elucidate the structure of (\pm) – nicotine. Confirm its structure by synthesis.

(3 × 10 = 30 Marks)
