



Reg. No. :

(Pages : 3)

F – 4685

Name :

First Semester M.Sc. Degree Examination, February 2019

Branch : Chemistry/Polymer Chemistry

CH/CL/CM/CA/ PC 212 : ORGANIC CHEMISTRY – I

Common for Chemistry CH/CL/CA/CM (2016 Admission Onwards) and
Polymer Chemistry (2018 Admission)

Time : 3 Hours

Max. Marks : 75

SECTION – A

Answer **any two** sub-questions among **a-c** from each question. **Each** sub-question carries **2** marks.

- Draw the structures of i) Ibuprofen ii) Thalidomide. Comment on their chirality.
 - What is *trans*-cyclooctene ? How it exhibits optical activity ?
 - Draw the structures of
 - 1, 3, 5-triazine
 - 1, 2, 4-triazole.
- Arrange the following carbocations in decrease in order of stability. Give reasons.
 $(\text{Ph})_3\text{C}^+$, CH_3^+ , $(\text{CH}_3)_3\text{C}^+$, $\text{CH}_3\text{-CH}_2^+$
 - Give any two methods of generation of free radicals.
 - What makes carbocation more stable ?
- What are benzyne ? Give an example involving benzyne.
 - Explain the term neighbouring group participation with an example.
 - Describe the effect of leaving group on the rate of $\text{S}_{\text{N}}1$ reactions.
- Outline the mechanism of normal aldol condensation reaction.
 - What is Hoffmann elimination ? Explain.
 - Outline the mechanism of Wittig reaction.



P.T.O.



5. a) What is Swern oxidation ? Give mechanism.
b) What are Lindlar catalysts ? Explain its significance.
c) Explain the importance of silver carbonate in organic chemistry.
(10×2=20 Marks)

SECTION - B


Answer either (a) or (b) of each question. Each question carries 5 marks.

6. a) What are atropisomers ? Give any two examples. Explain the designation of Configuration of atropisomers.
b) Explain the terms
i) ORD
ii) Circular dichroism.
7. a) Distinguish between transition state and intermediates.
b) What are carbanions ? Discuss the formation and structure of carbanions.
8. a) Outline the S_N2 mechanism. What is Walden inversion ?
b) Discuss the influence of solvent and leaving group on the rate of S_N2 reaction.
9. a) Describe the following :
i) Cram's rule
ii) *Cis* eliminations.
b) What is E2 elimination ? Explain the formation of C = C bond by E2 mechanism.
10. a) Write briefly on
i) Allylic oxidations
ii) Oxidations using Cr(vi) reagents.
b) Discuss the importance of the following in organic chemistry.
i) diimide
ii) Al-t-butoxide.
(5×5=25 Marks)


SECTION - C

Answer any three questions. Each question carries 10 marks.

11. Discuss the stereochemical nomenclature of chiral compounds by R, S, Z & E systems.
12. i) Describe the formation, structure and chemical reactions of carbenes.
ii) Explain the influence of structural features on the acidity of organic compounds.

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13. Describe the different mechanisms of esterification/ ester hydrolysis.
14. Comment on the stereochemistry of additions of HX, H₂O and X₂ to C = C systems.
15. Describe the applications of the following reagents in organic synthesis.
- DIBAL
 - Na CNBH₃
 - Lithium trialkyl borohydrides
 - Hindered borane.

(3×10=30 Marks)





Reg. No. :

Name :

First Semester M.Sc. Degree Examination, January 2017

Branch : CHEMISTRY

CH/CL/CA/CM 212 : Organic Chemistry – I
(2016 Admission)

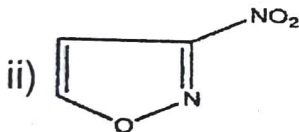
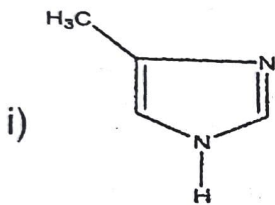
Time : 3 Hours

Max. Marks : 75

SECTION – A

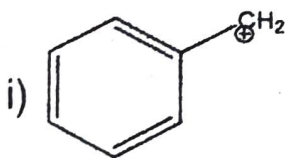
Answer **any two** among (a), (b) and (c) from **each** question. **Each** sub-question carries **2** marks.

1. a) Draw the structure of 7-Chlorobicyclo [2.2.2] octane.
b) Write the names of the following compounds :



c) What is meant by stereoconvergence ?

2. a) Draw all possible resonance structure for the following ions :



b) Why triphenylmethyl radical is highly stable ?

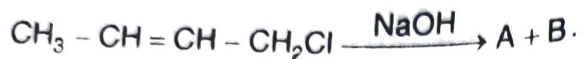
c) Account the following : 4-Nitrophenol is more acidic than 3-Nitrophenol.

B - 4962

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3. a) Solvolysis of t-BuBr in 60% ethanol at 55°C is 10^4 times faster than MeBr at the same conditions. Why?

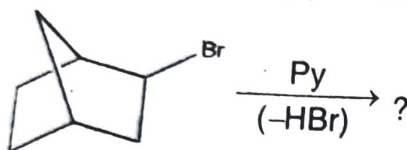
b) Predict A and B in the following reaction:



c) Give an example for aromatic $\text{S}_{\text{N}}1$ mechanism.

4. a) Give an example for trans hydroxylation of cyclohexane.

b) Predict the product(s) for the following reaction:



c) What is meant by Felkin-Anh model?

5. a) What is the oxidation product of 2, 3-Dihydroxypropane by LTA?

b) How do you prepare DCC? Give a reaction involving DCC.

c) Give an example for hindered borane and its reaction.

(2×10=20 Marks)

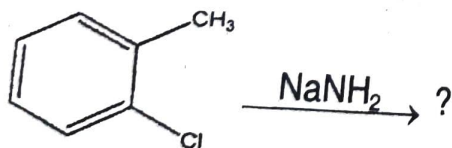
SECTION - B

Answer either (a) or (b) from each question. Each sub-question carries 5 marks.

6. a) Explain cotton effect with suitable example.

b) What are prostereoisomerism and stereotopicity? Explain.

7. a) Complete and suggest suitable mechanism for the following reaction:



b) When cyclobutylamine treated with nitrous acid (HNO_2) gives two products? What are the products? Explain.

8. a) Describe the mechanism of acid catalyzed ester hydrolysis.

b) Explain $\text{S}_{\text{N}}\text{A}_{\text{r}}$ mechanism with suitable examples.

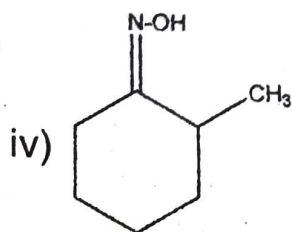
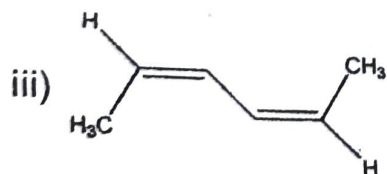
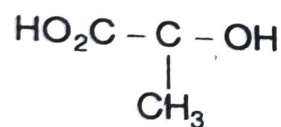
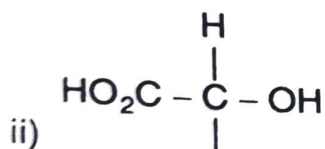
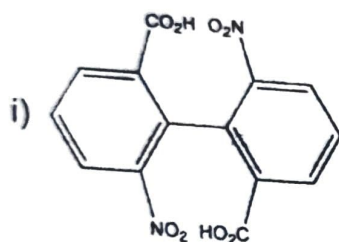
9. a) Predict the product(s) and suggest suitable mechanism the following reaction :
- $$\text{PhCHO} + \text{CH}_3\text{COCH}_2\text{CO}_2\text{Et} \xrightarrow[\text{O}^-]{\text{Et}_3\text{N}}$$
- b) Illustrate Reformatsky reaction with suitable examples.
10. a) Explain the reaction of 1-butene with ozone and give mechanism.
- b) Discuss Sommelet reaction with two examples.

(5×5=25 Marks)

SECTION - C

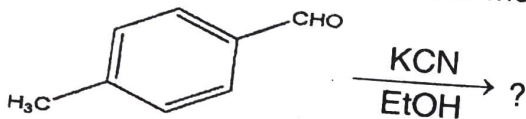
Answer any three questions. Each question carries 10 marks.

11. a) Illustrate circular dichroism and ORD with suitable example.
- b) Assign the following compounds R/S or E/Z configuration.

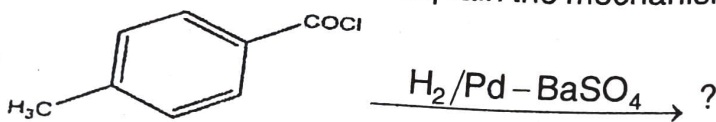




12. a) Discuss the formation, structure and reactions of nitrenes.
b) Explain three reaction involving carbanions.
13. a) What are non-classical carbocations? Explain their formations and reactions.
b) Discuss the mechanism of $S_{RN}1$ and S_Ni .
14. a) Complete the propose suitable mechanism for the following reaction :



- b) Discuss Darzen reaction with suitable example.
15. a) Predict the product and explain the mechanism of the following :



- b) Explain allylic oxidation with two examples.

(10×3=30 Marks)

First Semester M.Sc. Degree Examination – Model question paper
Branch III – Chemistry/ Branch IV – Analytical Chemistry
CH/CL 212: ORGANIC CHEMISTRY – I
 (2020 Admission Onwards)

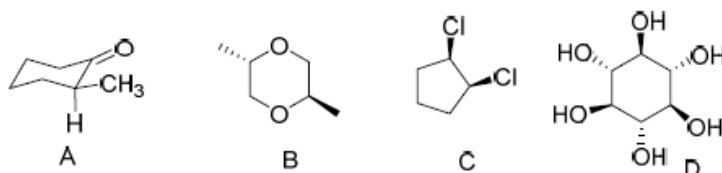
Time: 3 Hrs

Max. Marks: 75

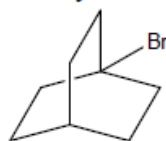
SECTION A

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

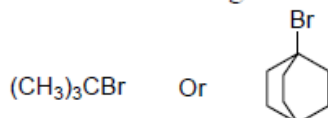
1. (a) Distinguish between conformation and configuration.
 (b) Draw the structure corresponding to diazabicyclo[2,2,2]octane.
 (c) Pick out the chiral/ achiral/ meso structures from the following.



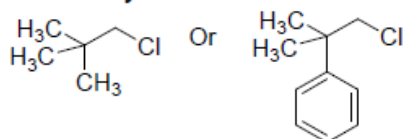
2. (a) What is AIBN?
 (b) Explain the peroxide effect in the addition of HBr to propene.
 (c) How you can synthesize the following molecule?



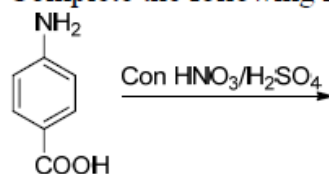
3. (a) Which of the following bromides will undergo a faster solvolysis? Explain



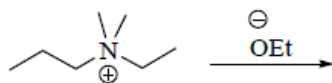
- (b) Given below are two chlorides. Which among them will go through a faster solvolysis? Give reasons for your answer.



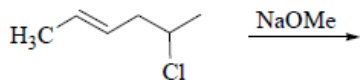
- (c) Complete the following reaction.



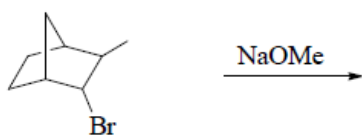
4. (a) Predict the product of the following reaction and indicate the major one. Give reasons.



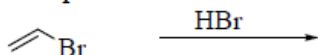
- (b) What are the products obtained the reaction given below. Identify the major product in this case citing reasons.



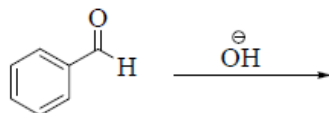
- (c) Identify the major product in the following reaction. Substantiate your answer.



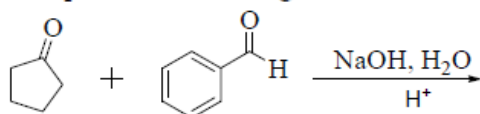
5. (a) Complete the reaction



- (b) Predict the products in the following reaction



- (c) Complete the following reaction

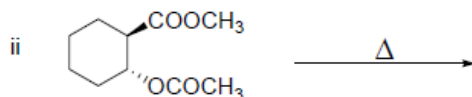
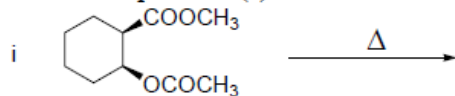


[2 × 10 = 20]

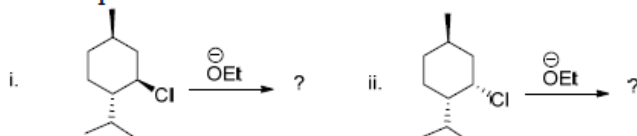
SECTION B

Answer either (a) or (b) from each question. Each sub question carries 5 marks

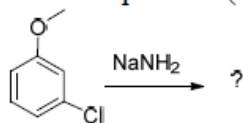
6. (a) Predict the product (s) of the following reactions



- (b) Predict the product (s) of the following reaction and indicate the major one. Explain?



7. (a) Give the product (s) with mechanism. Explain?



- (b) Discuss the mechanism of allylic bromination using NBS. Explain the stability of allyl radical.
8. (a) How will you convert isopropanol to n-propanol using a boron reagent? How does the addition of borane reagents to alkene differ from hydration? Illustrate with the help of an example.
- (b) Discuss benzoin condensation. What is the importance of cyanide in the reaction?
9. (a) Assign the absolute configuration to the following compounds.
-
- (b) What are atropisomers? Explain why atropisomerism disappears at higher temperature?
10. (a) How does leaving group affect the rate of S_N^1 and S_N^2 reactions? Explain.
- (b) Give the major product obtained when methoxybenzene is nitrated. Discuss the directive effect with the help of resonance structures

[5 × 5 = 25]

SECTION C

Answer any **three** questions. Each question carries 10 marks

11. Discuss Cotton effect? What is octant rule? Explain ORD curve.
12. Discuss the structure, stability and reactions of carbenes. How will you distinguish between singlet and triplet carbenes by a chemical method?
13. Discuss the mechanism of
- | | |
|------------------------|------------------------|
| a) Robinson Annulation | b) Mannich reaction |
| c) Thorpe reaction | d) Ritter reaction and |
| e) Darzen reaction | |
14. Neighbouring group participation results retention in configuration. Justify the given statement with the help of suitable examples. What is meant by anchimeric assistance?
15. Explain Wittig and Wittig–Horner reactions with stereochemistry. Compare Wittig reaction with Julia olefination.

[10 × 3 = 30]