

S.No. 5671 4/5/19 - AN P 8 CH 1/P 8 OC 1

(For candidates admitted from 2008-2015 Batch)

M.Sc. DEGREE EXAMINATION, APRIL 2019.

Chemistry / Organic Chemistry

ORGANIC CHEMISTRY — I

Time : Three hours

Maximum : 75 marks

PART A — ($10 \times 2 = 20$)

Answer ALL questions.

1. Define Hyperconjugation with example.
2. What is field effect? Give an example.
3. What is antiaromaticity? Give example.
4. State whether cyclooctatetraene is aromatic or not. Give reasons.
5. What is a diastereoisomer? Give an example.
6. State Cahn-Ingold-Prelog rules. Give example.
7. Define fluorescence and phosphorescence.
8. Give two examples of photooxidation reactions.
9. How will you generate carbenes?
10. Differentiate an intermediate from transition state.

PART B — (3 × 8 = 24)

Answer ALL questions

(a) Explain the HOMO-LUMO theory

Or

(b) Discuss Bronsted and HSAB theories. Give appropriate examples.

12 (a) Explain the synthesis and reactivity of pyrimidines and pyridazines.

Or

(b) Write notes on the aromaticity of annulenes and sydnones. Give examples.

13 (a) Discuss the various methods of determining configuration.

Or

(b) What is molecular chirality? Explain with two examples.

14 (a) Describe the mechanism of Paterno-Buchi reaction.

Or

(b) Write a note on the photochemistry of alkenes and dienes. Give examples.

15 (a) Discuss the stability and reactivity of singlet and triplet nitrenes.

Or

(b) Explain the characteristics of nucleophilic and electrophilic reactions.

PART C — (3 × 10 = 30)

Answer any THREE questions.

16. Explain the following with examples :

(a) Inductive effect

(b) Cross conjugation

(c) Electronegativity.

17 (a) Give one method each for the synthesis of oxazoles and pyrazines.

(b) Write notes on alternant and non-alternant hydrocarbons.

18. Elaborate the conformations of *cis*- and *trans*-decalins.

19. Discuss the mechanism of Norrish type I and II reactions.

20. Explain how following aspects will help in determining reaction mechanisms?

(a) Stereochemical studies and

(b) Substituent effect.

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(For candidates admitted from 2008 to 2015 Batch)

M.Sc. DEGREE EXAMINATION, APRIL, 2019.

Chemistry/Organic Chemistry

ORGANIC CHEMISTRY — II

Time : Three hours

Maximum : 75 marks

PART A — ($10 \times 2 = 20$)

Answer ALL Questions

1. What is benzyne intermediate?
2. Give two examples for neighbouring group participation.
3. What is transition state theory?
4. What is the product upon decomposition of diazonium salt?
5. What are the uses of Gilman reagent?
6. What is Hofmann degradation?
7. Give an example for electrocyclic reaction.

For candidates admitted from 2016-2017 onwards)

M Sc DEGREE EXAMINATION, APRIL 2019.

Chemistry

ORGANIC CHEMISTRY — I

Time : Three hours

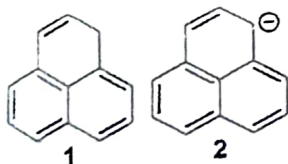
Maximum : 75 marks

PART A — (10 × 2 = 20)

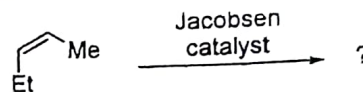
Answer ALL the questions.

4H-Pyran is not aromatic but pyrylium ion is aromatic. Justify.

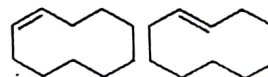
State whether phenalene 1 or the corresponding anion 2 is aromatic or not. Support your answer.



3. Write down the structure of Jacobsen catalyst and predict the product formed.



4. What are the uses of K-selectride and L-selectride?
5. Predict the major product upon the addition of HBr to $\text{CH}_3\text{CH}=\text{C}(\text{CH}_3)_2$ according to Markovnikov's rule. State whether the product is chiral or not.
6. Assign E or Z to the alkene in the following compounds:



7. The photodimerization of cyclopentenone affords two products. Identify.
8. Predict the product from the following reaction.



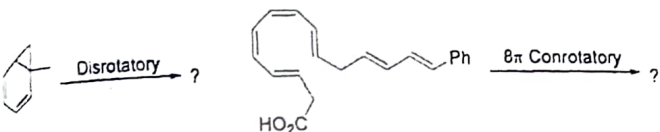
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14. (a) Discuss the mechanism of Barton reaction.

Or

(b) Write a note on the photochemistry of aromatic compounds with examples.

15. (a) Identify the product obtained in the following reactions.



Or

(b) Write down the reaction and mechanism of Claisen and Cope rearrangements.

PART C — (3 × 10 = 30)

Answer any THREE questions.

16. Discuss the aromaticity of [8]-, [10]-, [12]-, [16]-annulenes.

17. Explain the mechanism of

(a) Sommelet reaction and

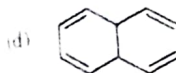
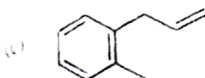
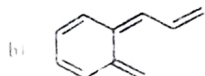
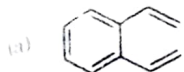
(b) Luche reduction.

18. Discuss the conformation of cis- and trans-decalins.

19. Explain the significances Norrish Type I and II reactions.

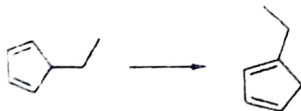
20. Discuss the stereochemistry involved in Diels-Alder reaction on the basis of Huckel-Mobius theory.

Which of the compounds a-d is the likely intermediate of the following transformation involving two electrocyclic reactions (ring opening and ring closure)?



II

Categorize the following reaction from the options given and propose a mechanism.



(a) Electrocyclic

(b) Chelotropic

(c) Sigmatropic

(d) Cycloaddition

PART B (5 × 5 = 25)

Answer ALL the questions.

11. (a) Discuss the concept of Möbius aromaticity with illustrations.

Or

- (b) Explain how NMR is helpful to identify aromaticity. Give suitable examples.

12. (a) Discuss the reaction and mechanism of Corey-Bakshi-Shibata reduction.

Or

- (b) Elaborate the utility of PCC and Wilkinson's catalysts. Give examples.

13. (a) Explain the chirality of allenes and spirans with examples.

Or

- (b) (i) Discuss the stereochemistry of helicenes. (3)

- (ii) What are enantiomers and diastereoisomers? Give examples. (2)

S.No. 2111

14/11/16 FH

P 8 CH 1/P 8 OC 1

(For candidates admitted from 2008-2009 onwards)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2016.

Chemistry/Organic Chemistry

ORGANIC CHEMISTRY – I

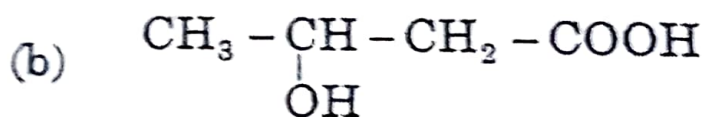
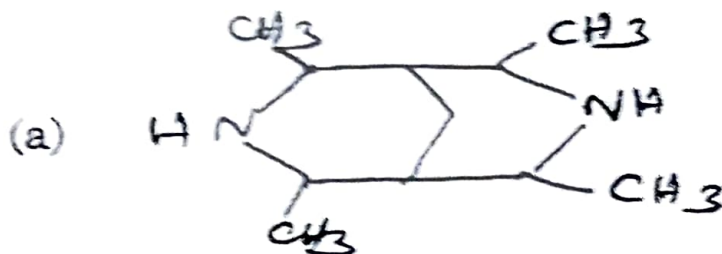
Time : Three hours

Maximum : 75 marks

PART A — (10 × 2 = 20)

Answer ALL questions.

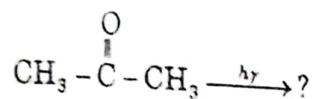
1. Give the IUPAC name of the following :



2. Phenol is acidic. Explain.
3. Cyclopentadiene is acidic. Give reason.
4. Define the term paratropic.

5. Define Walden inversion.
6. What is the need for E-Z nomenclature over cis-trans?

7. Predict the product(s) :



8. Predict the product(s) :



9. Give a method of generation of carbene.
10. The stability order of free radicals is similar to carbocation. Give reason.

PART B — (5 × 5 = 25)

Answer ALL questions.

11. (a) Explain the MO theory of chemical bonding.

Or

- (b) Describe steric inhibition of resonance with an example.

12. (a) What are alternant and non-alternant hydrocarbons? Explain with examples.

Or

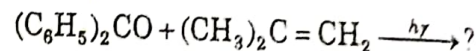
- (b) Give the synthesis, reactivity and applications of oxazoles.

13. (a) Give an account on atropisomerism.

Or

- (b) Discuss the conformational analysis of decalins.

14. (a) Predict the product(s) and suggest a suitable mechanism of the following :



Or

- (b) Explain the photochemical cis-trans isomerism with an example.

15. (a) How is CIDNP useful in the detection of free radicals?

Or

- (b) Describe primary kinetic isotope effect with an example.

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P 16 CH 11

candidates admitted from 2016-2017 onwards)

DEGREE EXAMINATION, NOVEMBER 2016.

Chemistry

ORGANIC CHEMISTRY — I

Three hours

Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

The 9, 10 bond of phenanthrene is more attractive towards electrophilic attack. Justify.

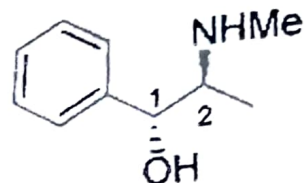
Define homoaromatic compounds with appropriate examples.

Write down the mechanism of Jacobsen epoxidation.

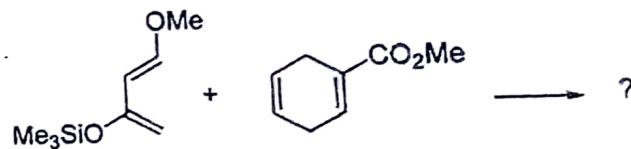
Give the mechanism of Woodward reaction.

Define atropisomerism with examples.

6. Identify the absolute configuration of the chiral centers of the following compound :



7. Identify the structure of the products formed in the 'head-to-head' and 'head-to-tail' dimerization of cyclohexenone.
8. Give an example each for photoreduction and photooxidation.
9. Predict the structure of the product formed in the following reaction. Justify your answer.

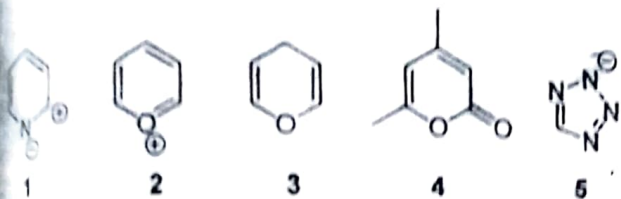


10. Give an example each for 1,7-hydrogen shift and ene reaction.

SECTION C — (3 × 10 = 30)

Answer any THREE questions.

- (a) [16] Annulene is anti-aromatic whereas [18]annulene is aromatic. Give supporting evidences.
- (b) Predict whether the following compounds are aromatic or not. Justify your answer.



Write a note on :

- (a) Swern oxidation,
- (b) Bayer-Villiger oxidation and
- (c) Luche reduction

Explain the various generations of asymmetric synthesis with examples for each.

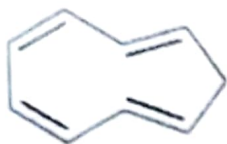
Explain Paterno-Buchi reaction and Norrish type I reaction.

20. (a) List out the types of dipoles in 1, 3-dipolar cycloadditions. Outline the synthesis of any two dipoles.
- (b) Write a note on Cope rearrangement.

SECTION B — (5 × 5 = 25)

Answer ALL questions.

Apply each of the following processes to cyclononatetraene, and decide whether the resultant species is aromatic or not :



(i) Addition of one more π electron, to give



(ii) Addition of two more π electrons, to give



(iii) Loss of $\text{H}^\cdot$ from the sp^3 -hybridized carbon

(iv) Loss of $\text{H}^\cdot$ from the sp^3 -hybridized carbons.

Or

(b) Write a note on the aromaticity of sydnones and fullerenes.

12. (a) Write a note on Sommelet reaction and Wilkinson's catalyst.

Or

(b) Discuss the uses of PCC, trialkylsilanes and TPAP.

13. (a) Write a note on the conformational aspects of cyclohexene and decalin.

Or

(b) Differentiate stereoselective and stereospecific reactions with appropriate examples.

14. (a) Explain with examples, the photochemistry of dienes and aromatic compounds.

Or

(b) Discuss photo Fries rearrangement and Barton reaction with examples.

15. (a) Explain the reaction and mechanism of Claisen rearrangement.

Or

(b) Write a note on Woodward and Hoffmann rules.

(Candidates admitted from 2008-2009 onwards)

GREE EXAMINATION NOVEMBER 2017

Chemistry Organic Chemistry

ORGANIC CHEMISTRY - I

Time: 3 hours

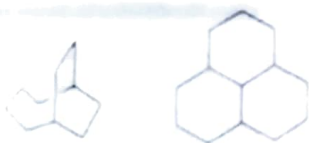
Maximum: 75 marks

PART A — (10 × 2 = 20)

Answer ALL questions.

1. Define dipole moment. Compare the dipole moment of toluene and nitrobenzene.

2. Give the IUPAC name for the following compounds



(b)

3. What do you mean by antiaromaticity? Give examples.

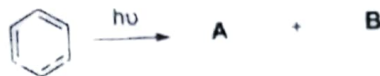
4. Account whether cycloheptatrienyl radical is aromatic or antiaromatic.

5. Differentiate enantiomers and diastereoisomers with examples.

6. What do you mean by Walden inversion?

7. What are the features of Jablonski diagram?

8. Predict the products A and B in the following reaction:



9. How will you generate singlet and triplet carbenes?

10. State Hammond's postulate.

PART B — (5 × 5 = 25)

Answer ALL questions.

11. (a) Explain the VB theory. (5)

Or

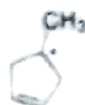
(b) Discuss the influence of "field effects" and "steric effects" on the strength of acids and bases. (2 × 2.5 = 5)

Explain the utility of stereochemical studies in determining reaction mechanism. (3)

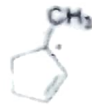
Or

Define the principle of microscopic reversibility.

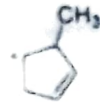
Which of the following carbocation is the most stable? Give reasons. (2 + 3)



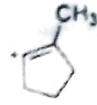
(1)



(2)



(3)



(4)

PART C (3 × 10 = 30)

Answer any THREE questions

1. Explain the following with suitable examples

Inductive effect

Electronegativity

Resonance

Field effect

(4 × 2.5 = 10)

2. Write a method for the preparation of oxazoles and pyridazines

Discuss the aromaticity of annulenes (5 + 5)

3. (a) Discuss the general features of electrophilic aromatic substitution reactions. Give an example. (5)

(b) Explain the conformations of cyclohexane. (5)

19. Discuss the Norrish type I and II reactions. (5)

20. (a) Explain the primary kinetic isotope effect with an example. (5)

(b) How does the crossover experiment aid in determining reaction mechanism? (5)

Describe the synthesis and reactivity of pyrimidines and pyrazoles. (2 × 2.5 = 5)

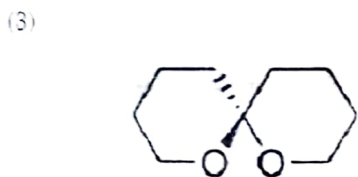
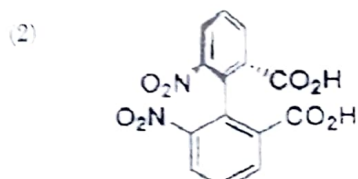
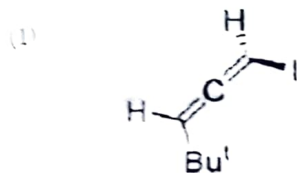
Or

Write a note on the aromaticity of sydnones and fullerenes. (2 × 2.5 = 5)

Draw the potential energy diagram and discuss the conformation of n-butane. (5)

Or

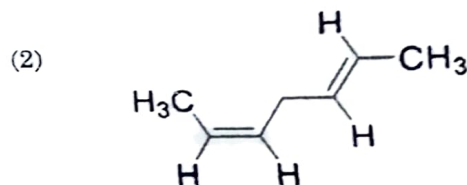
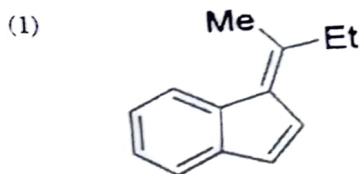
(i) Assign R/S configuration to the following compounds : (3)



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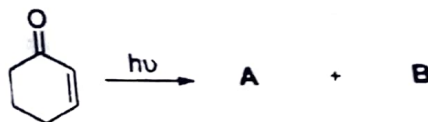
(ii) Assign E/Z to the olefinic bonds of the following compounds : (2)



14. (a) Write a note on Barton reaction. (5)

Or

(b) Identify A and B in the following reaction : (2 × 2.5 = 5)



4

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[P.T.O.]