

Unit - V

Ques 1> = (i) State whether [10] annulene is aromatic or not. Justify your answer (2 mark)

(ii) write a note on Möbius aromaticity (3)

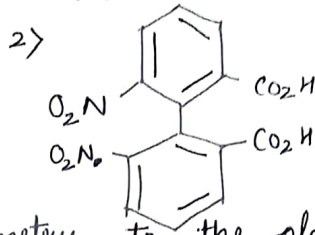
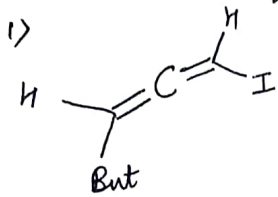
Ques 2> (i) Discuss the aromaticity of Sydnones (3).

(ii) Compare the aromaticity of Pentalene and Pentalene diene.

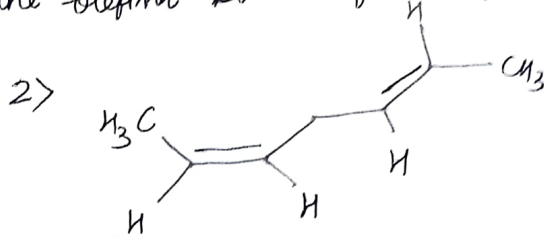
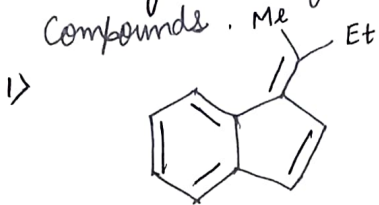
Ques 3> = ~~(a)~~ Explain the mechanism of Bayer-Villiger oxidation and Luche reduction. (5 mark)

Ques 4> = Write down the structure of DMP and TPAP. (2)

Ques 5> = (a) Assign R/S configuration to the following compounds.



(b) Assign E/Z geometry to the olefinic bonds of the following compounds.



Ques 6> = (a) Account whether cycloheptatrienyl radical is aromatic, antiaromatic or non-aromatic (3).

(b) Explain Alternant and non-alternant hydrocarbon (7).

Ques 7> = Discuss the synthetic applications of the following reagents :-

L and K Selectrides (4)

Ques 8> = (a) Explain the conformation of cyclohexene. (5)

(b) Write a note on the chirality of helicenes and cyclophanes. (5)

Ques 9> = what do you mean by anti-aromaticity? Give examples (2).

Ques 10> = Account whether cycloheptatrienyl radical is aromatic or antiaromatic (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

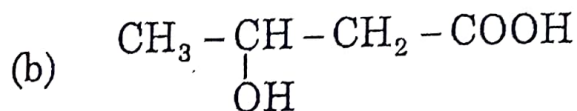
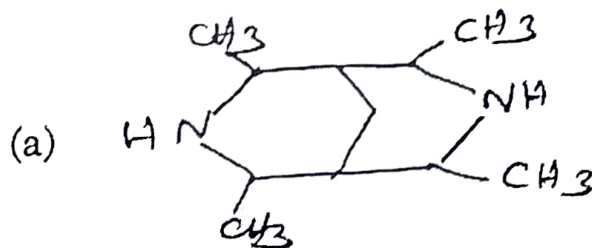
Time : Three hours

Maximum : 75 marks

PART A — (10 × 2 = 20)

Answer ALL questions.

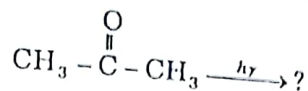
1. Give the IUPAC name of the following :



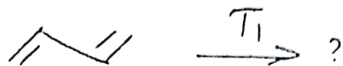
2. Phenol is acidic. Explain.
3. Cyclopentadiene is acidic. Give reason.
4. Define the term paratropic.

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

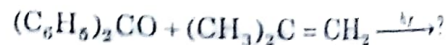
- (b) Give the synthesis, reactivity applications of oxazoles.

13. (a) Give an account on atropisomerism.

Or

- (b) Discuss the conformational analysis of decalins.

14. (a) Predict the product(s) and suggest a 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 radicals?

Or

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

No. 8172

18/11/17 Fwd

P 16 CH 11

For candidates admitted from 2016-2017 onwards)
DEGREE EXAMINATION, NOVEMBER 2017.

Chemistry

ORGANIC CHEMISTRY - I

Time: Three hours

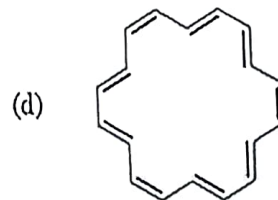
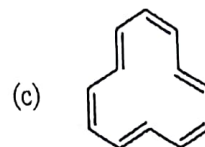
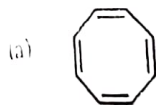
Maximum : 75 marks

PART A — (10 × 2 = 20)

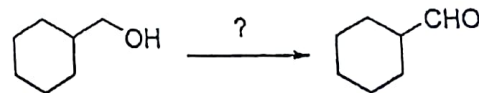
Answer ALL questions.

What is ring current effect? Give example. (1+1)

Assuming that all are planar, which of the following structure would be considered aromatic? Justify your answer. (1+1)

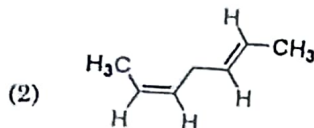
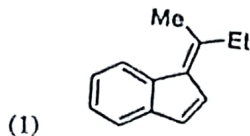


3. Comment on the reactivity of NaBH_4 and NaCNBH_3 . Give examples.
4. Which of the reagent given below will be the best to accomplish the following transformation? Give reasons. (1+1)



- | | |
|---------|-----------|
| (a) CAN | (b) MCPBA |
| (c) DMP | (d) PCC |
5. What is anomeric effect? Give an example.
 6. What are diastereoisomers? Give two examples. (1+1)

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

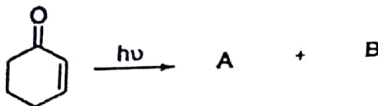


Or

- (b) (i) Write the Cahn-Ingold-Prelog's rules. (2)
 (ii) Discuss the chirality in molecules with N, S and P. Give examples. (3)
14. (a) Write a note on Barton reaction. (5)

Or

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



15. (a) Explain Diels-Alder reaction. (5)

Or

- (b) (i) List out the selection rules for sigmatropic reactions. (2)
 (ii) Write a note on Favorski rearrangement. (3)

PART C — (3 × 10 = 30)

Answer any THREE questions.

16. (a) Account whether cycloheptatrienyl radical is aromatic, antiaromatic or nonaromatic.
 (b) Explain alternant and non-alternant hydrocarbons. (3+7)
17. Discuss the synthetic applications of the following reagents: (3+3+4)
 (a) IBX
 (b) Wilkinson catalyst
 (c) L and K selectrides
18. (a) Explain the conformation of cyclohexene.
 (b) Write a note on the chirality of helicenes and cyclophanes. (5+5)

1188 26/11/18 P 16 CH 11

Candidates admitted from 2016 – 2017 onwards)

DEGREE EXAMINATION, NOVEMBER 2018.

Chemistry

ORGANIC CHEMISTRY – I

Three hours

Maximum : 75 marks

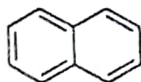
SECTION A — (10 × 2 = 20)

Answer ALL questions.

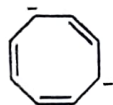
Which of these structures can be classified as aromatic? Give reason. (1 + 1)



I



II



III

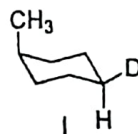
(a) I, II and III

(b) II and III only

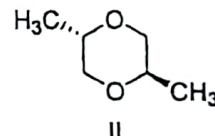
(c) I and II only

(d) II only

- In the proton NMR of [18]-annulene, the outer hydrogens appear at 9 ppm whereas the inner hydrogens appear at -2 ppm. Why?
- Give two uses of L- and K-selectrides.
- Write down the mechanism of Jones epoxidation.
- Differentiate stereoselective and stereospecific reaction with an example.
- State whether the following compounds are chiral or achiral. Support your answer.



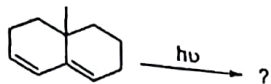
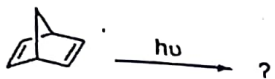
I



II

- What do mean by phosphorescence?
- What is photoisomerization? Give an example.
- Give the structure of the two dienes formed upon thermal ring opening of *cis*-3, 4-dimethylcyclobutene.

- (i) Predict the product in the following reactions : (2)



- (ii) Give the mechanism of Paterno-Buchi reaction. (3)

Or

- (b) Explain Norrish type I and II reactions.
- (a) Draw the correlation diagram for disrotatory conversion of butadiene to cyclobutene. Is the process allowed or forbidden? Explain.

Or

- (b) Write a note on 1, 3-dipolar cycloaddition reactions.

SECTION C — (3 × 10 = 30)

Answer any THREE questions.

- (a) Discuss the aromaticity of fullerenes. (5+5)
- (b) Explain alternant and nonalternant hydrocarbons.

17. Write a note on the following: (4+3+3)

- (a) Luche reduction
(b) Elbs reaction
(c) Swern oxidation

18. (a) Account on the conformation of bridged ring systems with examples. (6+4)
(b) Explain anomeric effect.

19. Write short notes on

- (a) photo-Fries rearrangement
(b) Barton reaction (5+5)

20. Discuss the reaction and mechanism of Cope and Claisen rearrangements. (5+5)

(For candidates admitted from 2016 – 2017 onwards)
No. 6150 11/5/17 P 16 CH 11

M.Sc. DEGREE EXAMINATION, APRIL 2017.

Chemistry

ORGANIC CHEMISTRY – I

Time: Three hours

Maximum : 75 marks

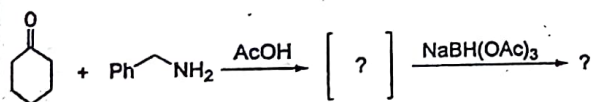
SECTION A — (10 × 2 = 20)

Answer ALL questions.

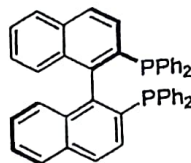
Define ring current effect.

What are mesoionic compounds? Give examples.

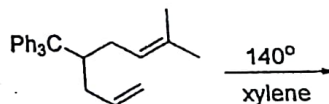
Predict the intermediate and the product in the following reaction:



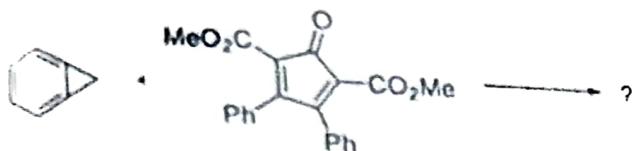
4. Give the mechanism of Shi epoxidation.
5. Define anomeric effect.
6. Predict the configuration of the following compound:



7. Butadiene undergoes triplet sensitized cycloaddition to afford three products. Identify the structure of these.
8. Identify all the possible stereochemical oxetanes when benzaldehyde is irradiated in the presence of 2-methylbut-2-ene.
9. Predict the product in the following ene reaction:



Predict the product in the following chelotropic reaction



SECTION B — (5 × 5 = 25)

Answer ALL questions, choosing either (a) or (b)

(a) (i) Explain whether cycloheptatrienyl radical is aromatic or anti-aromatic

(ii) Write a note on Möbius aromaticity.

Or

(b) (i) Compare the aromaticity of the two isomers of [10] annulenes.

(ii) Write a note on the aromaticity of fullerenes.

12. (a) Discuss the utility of the following

(i) CAN

(ii) Wilkinson's catalyst

(iii) K-Selectride.

Or

(b) Explain the mechanism involved in Sommelet reaction and Corey-Bakshi-Shibata reduction.

13. (a) Discuss the conformation of decalin.

Or

(b) (i) What are the basic requirements for optical isomerism?

(ii) Explain nitrogen inversion with examples.

14. (a) Explain Norrish type I and II reactions.

Or

(b) Write a note on Barton reaction and photo Fries rearrangement.

- (a) With suitable examples discuss the significances of sigmatropic 1,3 and 1,7 hydride shifts.

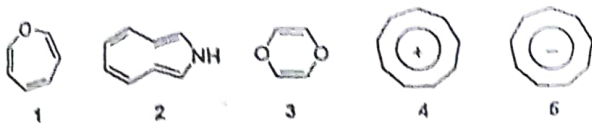
Or

- (b) Write a note on 1,3-dipolar cycloadditions.

SECTION C — ($3 \times 10 = 30$)

Answer any THREE questions.

16. (a) Classify each of the following molecules as aromatic, nonaromatic or anti-aromatic. Support your answer.



- (b) Discuss alternant and non-alternant hydrocarbons with examples.
17. (a) Write a note on Prevost reaction.
- (b) Discuss the mechanism involved in Noyori asymmetric hydrogenation.
18. (a) Discuss the conformation of norbornane.
- (b) Discuss the configurations and conformations of di-substituted cyclohexanes

19. (a) With appropriate examples discuss the photochemistry of α, β -unsaturated compounds.

- (b) Explain the mechanism involved in di- π -methane rearrangement.

20. Discuss the reaction and mechanism involved in Cope and Claisen rearrangements.

(6 pages)

S.No. 5688

61519-AN

P 16 CH 11

(For candidates admitted from 2016-2017 onwards)

M.Sc. DEGREE EXAMINATION, APRIL 2019.

Chemistry

ORGANIC CHEMISTRY — I

Time : Three hours

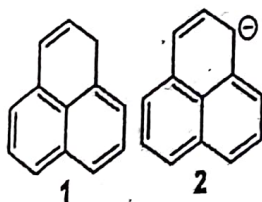
Maximum : 75 marks

PART A — (10 × 2 = 20)

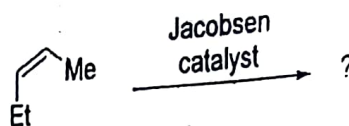
Answer ALL the questions.

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.

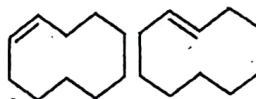


3. Write down the structure of Jacobsen catalyst and predict the product formed.

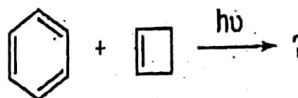


4. What are the uses of K-selectride and L-selectride?
5. Predict the major product upon the addition of HBr to $\text{CH}_3\text{CH}=\text{C}(\text{CH}_3)_2$ according to Markovnikov's rule. State whether the product is chiral or not.

6. Assign E or Z to the alkene in the following compounds:

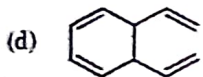
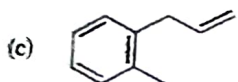
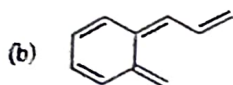
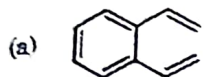
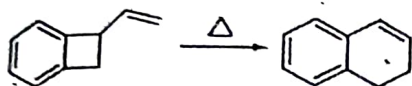


7. The photodimerization of cyclopentenone affords two products. Identify.
8. Predict the product from the following reaction.

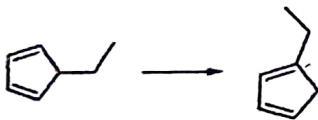


S.No.

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



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

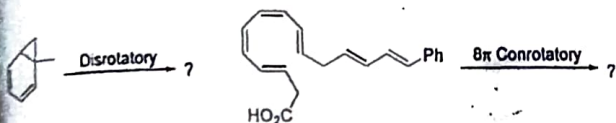
- (b) (i) Discuss the stereochemistry of helicenes. (3)

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

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.