647510 **MscorgCC1020** **Seat No :_____**

M.Sc.(Chem.) Semester - 1 (*CBCS*) Examination
Jan/Feb.-2022 [NEW COURSE]
ORGANIC CHEMISTRY(CORE)

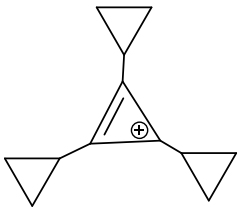
Time: 1:30 Hours **Marks: 42**

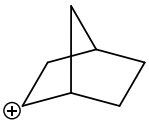
Instructions:

1. Figures to the right indicate marks.
2. There are five questions in the question paper.
3. Answer any three of the following questions.

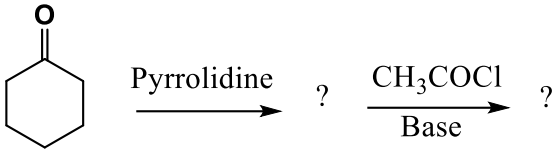
Q.1 (a) **Answer the following** **4 Marks**

(1) Discuss the stability of following carbocation: 2





(2) Predict the appropriate product of the following reaction and write its mechanism: 2

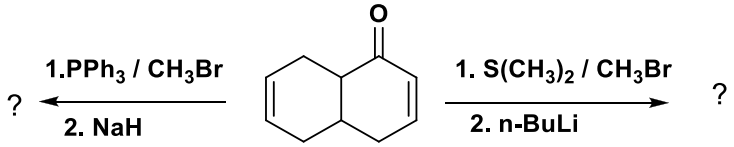


Q.1 (b) **Answer any two question out of three.** **10 Marks**

(1) What is carbene? Discuss addition reaction of singlet and triplet carbene with cis and trans-2-butene along with mechanism. 5

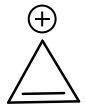
(2) How will you generate Nitrene? Explain reactivity of Nitrene with suitable example. 5

(3) What are ylides? Predict the appropriate product of the following reactions and write its mechanism: 5



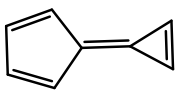
Q.2 (a) **Answer the following** **4 Marks**

(1) Classify the following compounds (A to H) as per their aromatic/anti-aromatic/non-aromatic character. Justify your answer. 4



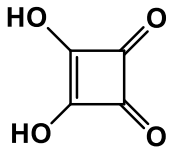
A

B



C

D



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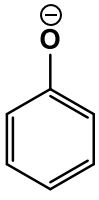

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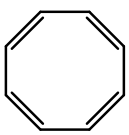

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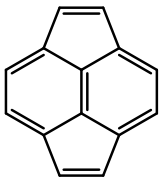


H

Q.2 (b) **Answer any two question out of three.** **10 Marks**

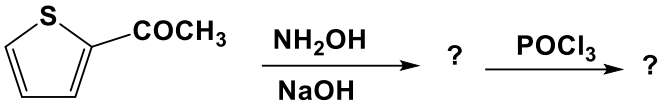
(1) State Huckel's rule for aromaticity and write three examples of (a) aromatic compounds (b) anti-aromatic compounds (c) non-aromatic compounds. 5

(2) Explain aromaticity and stability of following: (a) $C_5H_5^+$ (b) $C_7H_7^+$ (c) C_6H_4 5

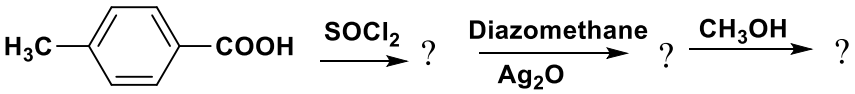
(3) What are annulenes? Describe aromaticity in: (a) [10]annulene, (b) [14]annulene and (c) [18]annulene. 5

Q.3 (a) **Answer the following** **4 Marks**

(1) Complete the following reaction sequence with mechanism. 2



(2) Complete the following reaction sequence with mechanism. 2



Q.3 (b) **Answer any two question out of three.** **10 Marks**

Describe principle, mechanism and three applications of following: 5

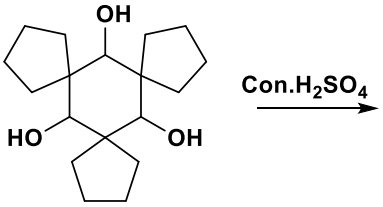
(1) Robinson annulation

(2) Nazarov cyclization 5

(3) Vilsmeier-Haack formylation 5

Q.4 (a) **Answer the following** **4 Marks**

(1) Complete the following reaction sequence with mechanism. 2

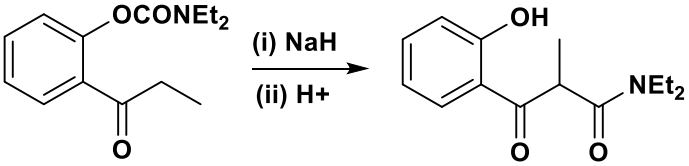


(2) Describe reactivity of phenylisocyanate towards various nucleophiles with examples. 2

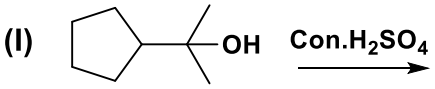
Q.4 (b) **Answer any two question out of three.** **10 Marks**

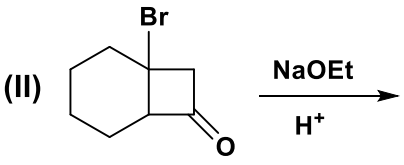
(1) Describe Principle, mechanism and three applications of Baeyer-Villiger rearrangement. 5

(2) Identify the following rearrangement, write its mechanism and give three examples: 5



(3) Complete the following reaction sequence with mechanism: 5

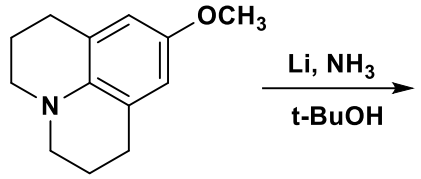




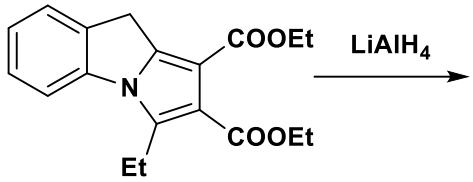
Q.5 (a) **Answer the following** **4 Marks**

(1) Predict the product of the following reaction: Justify your answer. 2

(I)

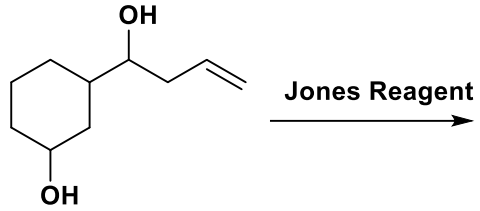


(II)

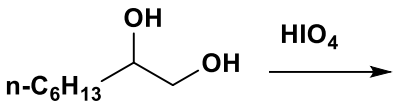


(2) Predict the product of the following reaction: Justify your answer. 2

(I)



(II)



Q.5 (b) **Answer any two question out of three.** **10 Marks**

Write a note on following reagents:

(1) Dess-Martin reagent 5

(2) Swern oxidation reagent 5

(3) SeO_2 5

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