RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. THIRD SEMESTER EXAMINATION, MARCH 2022

SECOND YEAR [BATCH 2020-23]

Date : 05/03/2022 **CHEMISTRY (HONOURS)**

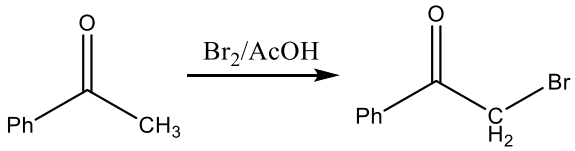
Time : 11 am – 1 pm **Paper : VI [CC6]** Full Marks : 50

[Attempt **one question** from **each unit**]

Unit –I

[13 marks]

1. a) In the Perkin reaction Styrene is a side product along with Cinnamon acid. Propose a mechanism which can explain both the products.

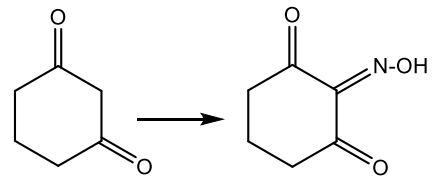
b) 

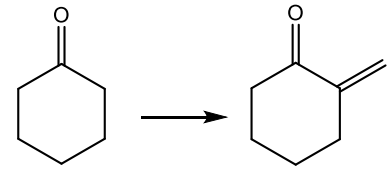
Give mechanism for the above reaction. Explain why the reaction is stopped at the monobromination stage.

c) p-N,N-Dimethylaminobenzaldehyde fails to undergo Benzoin condensation with KCN/EtOH, but the condensation takes place when mixed with benzaldehyde – explain.

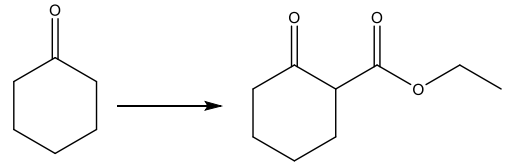
d) Explain the observation that the cyclopropanone forms a stable hydrate. [3+2+3+1]

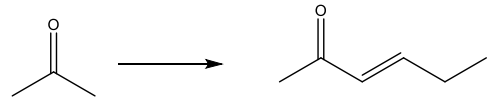
e) Carry out the following conversions: [2×2]

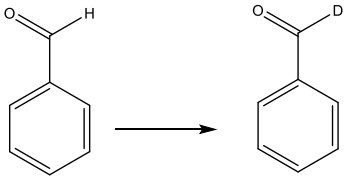
i) 

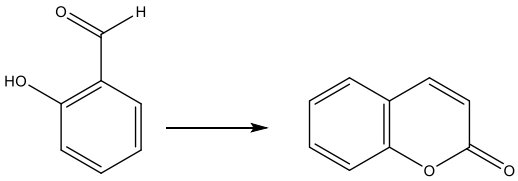
ii) 

2. a) Carry out the following conversions: (mechanism is not necessary) [4×2]

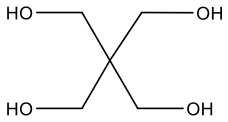
i) 

ii) 

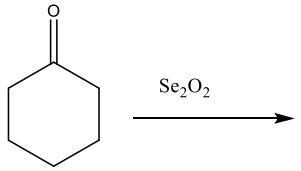
iii) 

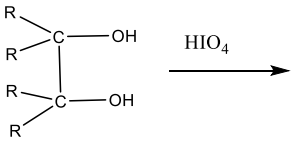
iv) 

b) Outline the synthesis of the following molecule starting from acetaldehyde : [2]



c) Predict the product of the following reactions and also give mechanism : [1.5×2]

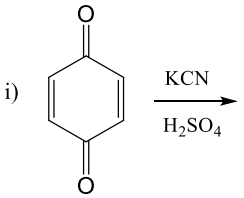
i) 

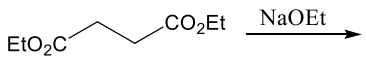
ii) 

Unit –II

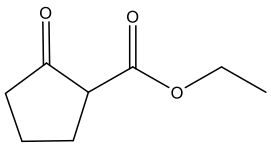
[12 marks]

3. a) Predict the product for the following reactions with mechanism : [2×2]

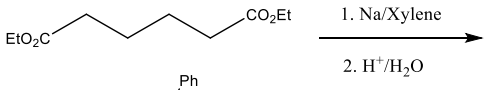
i) 

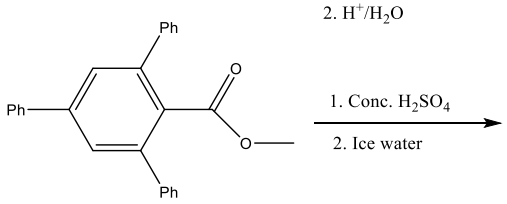
ii) 

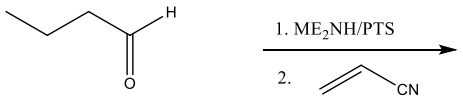
b) Outline the synthesis of the following molecule starting from diethyl malonate: [2]



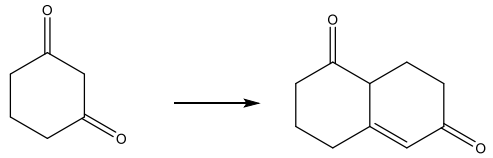
c) Identify the products in the following reactions and explain their formation: [3×2]

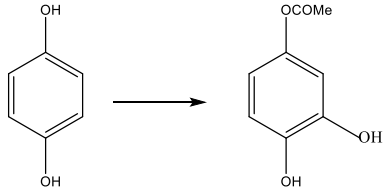
i) 

ii) 

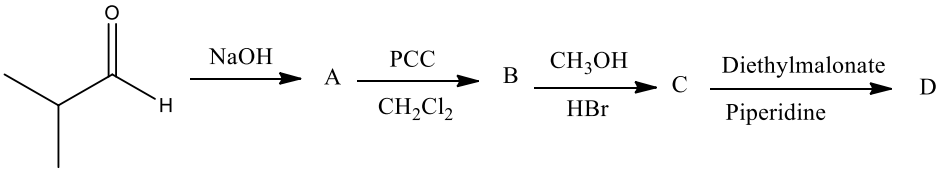
iii) 

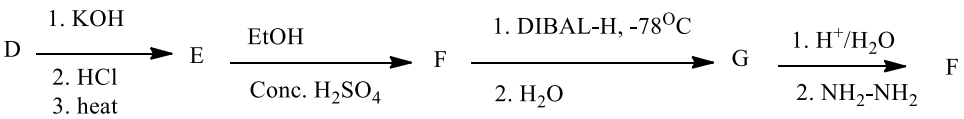
4. a) Carry out the following conversions and also give mechanism [2×2]

i) 

ii) 

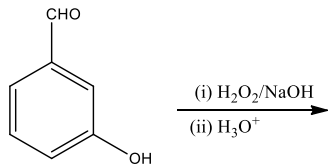
b) Predict the products (A-H) in the following reaction sequence. [8×1]

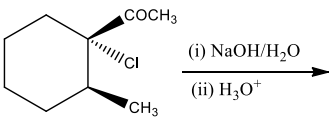


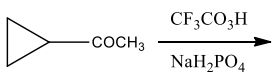


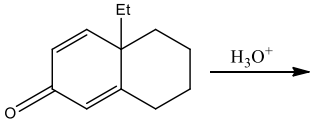
Unit –III [13 marks]

5. a) Predict the products for the following reactions with mechanism : [5×2]

i) 

ii) 

iii) 

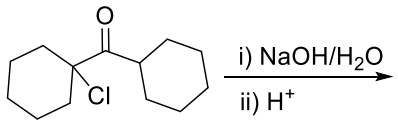
iv) 

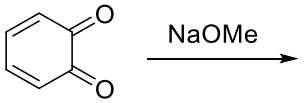
v) PhCOCOPh $\xrightarrow[(ii)\ H_3O^+]{(i)\ NaOH\ soln.}$

b) Give one synthetic use of Diazoacetic ester and diazomethane with mechanism. [1.5×2]

6. a) Predict the product for the following reactions and also explain the mechanism: [3×2]

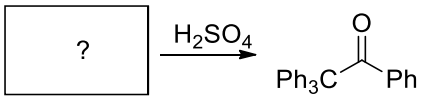
i) $RCOOH + HN_3 \xrightarrow{H_2SO_4}$

ii) 

iii) 

b) Justify or Criticize: i)Beckmann rearrangement is an intramolecular rearrangement.
ii) Arndt-eister synthesis is an intermolecular rearrangement. [2×2]

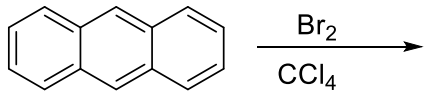
c) Complete the following conversions: (give mechanism) [2]

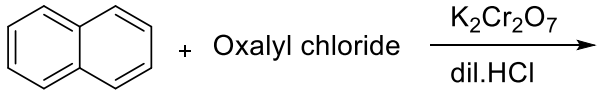


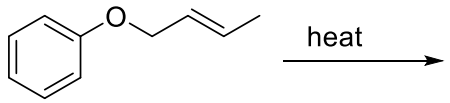
d) Explain the reaction with example: Eschweiler –Clarke methylation [1]

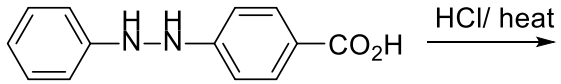
Unit –IV [12 marks]

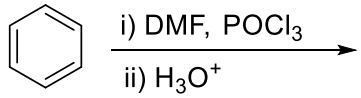
7. a) Predict the products for the following reactions with mechanism: [5×2]

i) 

ii) 

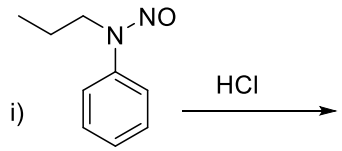
iii) 

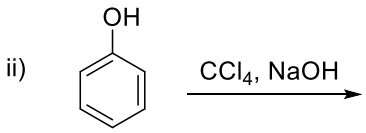
iv) 

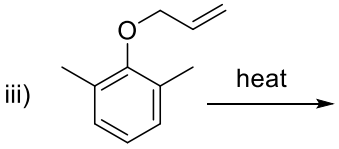
v) 

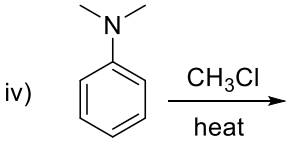
b) Justify or Criticize: Orton rearrangement is an intramolecular rearrangement. [2]

8. a) Predict the following reactions with mechanism: [4×2]

i) 

ii) 

iii) 

iv) 

b) Complete the following conversion : [2×2]

i) Napthalene to Phenantherne

ii) Napthalene to Anthracene

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