MANIPAL
ACADEMY of HIGHER EDUCATION
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Reg. No.										

DEPARTMENT OF SCIENCES, IV SEMESTER M.Sc (CHEMISTRY)
END SEMESTER EXAMINATIONS, June 2021
SUBJECT: Advanced Organic Chemistry-II [CHM 5202]
(REVISED CREDIT SYSTEM-2017)

Time: 2 Hours Date: 10-06-2021 MAX. MARKS: 40

Note: (i) Answer any **FOUR FULL** questions
(ii) Write reactions, structures, and mechanisms wherever necessary

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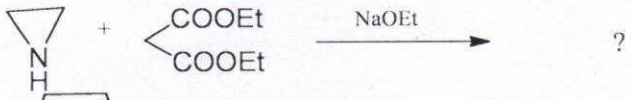
1A. i) Describe any two synthetic methods of azetidin-2-one and explain its acid-catalyzed ring-opening reactions.

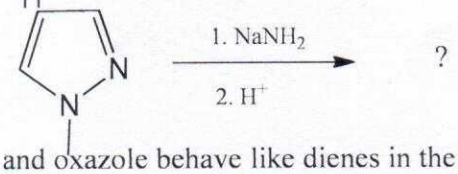
ii) Give reason: Pyridine is very unreactive to electrophilic substitution reactions

B. Write the product/s and explain the mechanism for the following reactions

i)



ii)

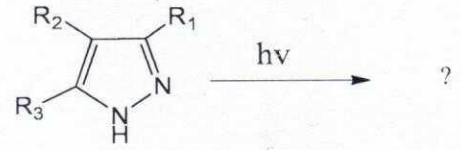


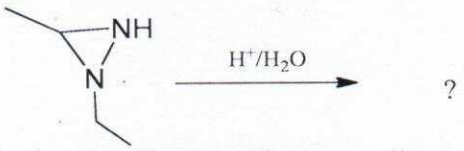
C. Furan and oxazole behave like dienes in the Diels-Alder reaction. Justify with appropriate examples.

[4+4+2]

2A. i) Describe the synthesis and chemical properties of thiiranes.

ii) Predict the product/s in the following reactions.





B. Explain the classification of heterocyclic compounds as aromatic, non-aromatic and anti-aromatic based on Dewar resonance energy and diamagnetic susceptibility exaltation.

C. Discuss different modes of ring opening reactions of oxaziridines with acids.

[4+4+2]

3A. i) Discuss the thermal and photochemical reactions of oxetane

ii) Describe the synthesis and reactivity of phthalazines

B. i) Explain the formation and reactions of carbenes generated from a diazirine with illustrative example

ii) Describe thermal and photochemical reactions of Azepines

C. Explain the bond order and bond length relationships in aromatic heterocycles

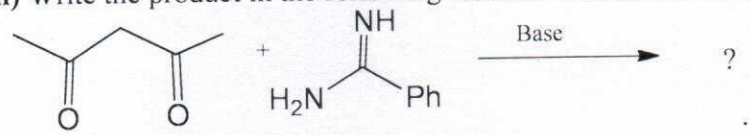
[4+4+2]

4A. i) Discuss and Compare the electrophilic substitution reactions of indole, benzofuran and benzothiophene

ii) Give reason: 2-Nitro furan is less reactive than furan towards acids

B. i) Explain the synthesis of pyridazine starting from maleic anhydride

ii) Write the product in the following reaction with mechanism



C. Give reasons for the following;

i) Isoxazole is less basic than oxazole

ii) Pyrazole is resistant to the action of oxidizing agents

[4+4+2]

5A .i) Compare the electrophilic substitution reactions of imidazole, oxazole and thiazole

ii) Give reason: Electrophilic attack in pyrrole takes place at 2-position while at 3-position in indole

B. i) Describe Hantzsch-Widman method for the systematic naming of heterocyclic compounds

ii) Describe the synthesis, electrophilic and nucleophilic reactions of 1,2,4-triazole.

C. Give reasons for the following;

i) Oxazoles function as dienes in Diels-Alder reaction

ii) Furan is less reactive than Pyrrole for electrophilic substitution reaction

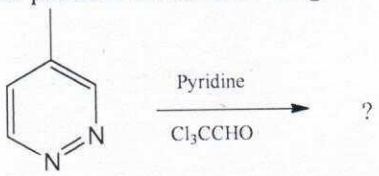
[4+4+2]

6A. i) Discuss the synthesis, electrophilic and nucleophilic reactions of pyrimidine

ii) Give reason: pyridine is reduced more readily than benzene

B. i) Discuss the preparation and chemical properties of benzopyrazole

ii) Write the product in the following reaction with mechanism



C. Describe Skraup quinolone synthesis.

[4+4+2]

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