Reg. No.

MANIPAL
ACADEMY of HIGHER EDUCATION

DEPARTMENT OF SCIENCES, IV SEMESTER M.Sc (CHEMISTRY)
END SEMESTER EXAMINATIONS, July 2020

Advanced Organic Chemistry II [CHM 5202]

(REVISED CREDIT SYSTEM-2017)

Time: 2 Hours | Date: 06 Jul 2020 | MAX. MARKS: 25

Note: Answer **ALL** questions

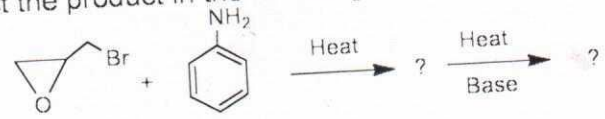
1A. Describe any two synthetic methods of azetidin-2-one and explain its acid-catalyzed ring-opening reactions. 3

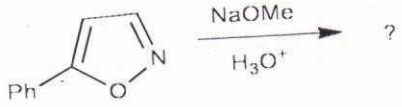
B. Furan and oxazole behave like dienes in the Diels-Alder reaction. Justify with appropriate example. 2

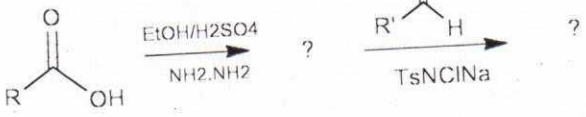
2A. i) Explain Paal-Knorr furan synthesis with a suitable mechanism. 3
ii) Give two general methods for 1,2-azole synthesis

B. Give a reason for the following 2
i) Furan undergo electrophilic substitution much faster than benzene
ii) Imidazole is a stronger base than oxazole

3A. Predict the product in the following reactions 3

(i) 

(ii) 

(iii) 

B. Write the chemical reaction for the preparation of an 8-membered heterocyclic compound having (i) only N and (ii) only O as heteroatom atom. 2

4A. Write the chemical reaction to prepare (i) 2H-pyran and (ii) 4H-pyran. Justify the statement: There is a difficulty in the preparation of 3-substituted-2H-pyran. 3

B. Propose the reaction for the preparation of the following molecules starting with a substrate which does not have a carbonyl group. (i) thiepine, (ii) oxipine, (iii) benzazepine and (iv) thiazepine. 2

5A. Write the chemical reaction for the preparation of pyridazine, pyrimidine and pyrazine. Use suitable diketone as starting material 3

B. Explain the conditions to classify heterocyclic molecules as aromatic, non-aromatic and anti-aromatic based on (i) Dewar resonance energy, and (ii) diamagnetic susceptibility exaltation. 2

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