
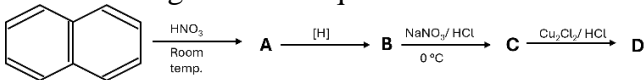


Name: Enrolment No:	
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UPES End Semester Examination, May 2024	
Course: Chemistry of Advanced Organic Compounds Program: MSc Chemistry Course Code: CHEM7054	Semester: II Time : 03 hrs. Max. Marks: 100
Instructions: Read all the below mentioned instructions carefully and follow them strictly: <ol style="list-style-type: none"> 1) Mention Roll No. at the top of the question paper. 2) Do not write anything on the question paper except roll number. 3) Attempt all the parts of a question at one place only. 4) Internal choice is given only in Q 9 and 11. 	

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Complete the following reaction sequence: 	4	CO2
Q 2	Carry out following conversions: a. Thiophene to sulfone. b. Thiophene to n-butane.	4	CO2
Q 3	What happens when furfural reacts with: a. Sodium hydroxide? b. Sodium acetate in the presence of acetic anhydride?	4	CO2
Q 4	Name four reducing agents along with their formulae/ structures.	4	CO1
Q 5	Which of the two is stronger base: pyridine or piperidine? Justify your answer.	4	CO1

SECTION B
(4Qx10M= 40 Marks)

Q 6	An organic compound 'A' (C ₁₀ H ₈) on oxidation with acidic KMnO ₄ gives 'B' (C ₈ H ₆ O ₄), which on heating produces 'C' (C ₈ H ₄ O ₃). 'C' on reaction with benzene in the presence of anhydrous AlCl ₃ followed by H ₂ SO ₄ gives 'D' (C ₁₄ H ₈ O ₂) which produces a compound containing sulfur 'E' (C ₁₄ H ₈ O ₅ S) on treatment with sulfuric acid. 'E' reacts with	10	CO3
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	NaOH to give sodium derivative of a compound 'F' (C ₁₄ H ₈ O ₄) which is a dye and converts to a trihydroxy compound 'G' (C ₁₄ H ₈ O ₅) on reaction with MnO ₂ and H ₂ SO ₄ . Identify compounds 'A' to 'G', and complete the reaction sequence.		
Q 7	What happens when bromopyridine reacts with ammonia at 177 – 197 °C? Which reaction is this? Also write the mechanism of this reaction.	10	CO3
Q 8	Cause the nitration of quinoline along with its mechanism.	10	CO3
Q 9	Why does isoquinoline give nucleophilic substitution reactions? Justify the suitable position for the attack of nucleophile in isoquinoline with an example. OR Prove that nitrogen atom in isoquinoline is present at 2 nd position in its structure.	10	CO2
SECTION-C (2Qx20M=40 Marks)			
Q 10	Write short notes on the following: a. NaBH ₄ b. Sodium cyanoborohydride c. Osmium tetroxide d. Aluminium isopropoxide	20	CO1
Q 11	a. Write the synthesis of indole starting from o-nitrophenol acetaldehyde. What is the basic process involved in this reaction? b. What happens when acetonyl acetone is heated with ammonia? c. Draw the structure of indigotin. Why is it named so? How can it be synthesized from naphthalene? OR a. How does indole react with chloroform in alkaline medium? Which reaction is this? Which type of intermediate is formed in this reaction? b. Suggest two chemical reactions which can prove that pyrrole behaves similar to phenol. c. Draw the structure of isatin along with its isomeric forms. Complete its synthesis starting from o-nitrobenzoyl chloride.	5+5+10	CO1, CO2, CO2