Name: **Enrolment No:**	UPES UNIVERSITY OF TOMORROW

UPES

End Semester Examination, May 2025

Course: Chemistry of Advanced Organic Compounds **Semester: II**

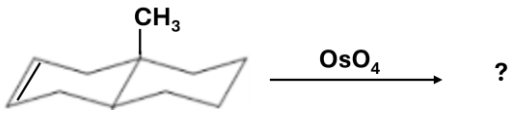
Program: MSc Chemistry **Time: 03 hrs.**

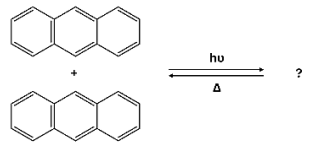
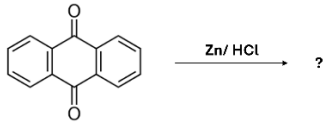
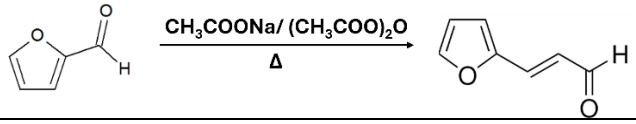
Course Code: CHEM7065 **Max. Marks: 100**

Instructions: Read all the below-mentioned instructions carefully and follow them strictly:

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.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Why does pyridine undergo nucleophilic substitution reactions? What is the appropriate position of attack in such reactions? Support your answer with all the required structures.	**4**	**CO2**
Q 2	Complete the following reaction stereochemically:  Also specify the reason of the specific geometry of the product obtained.	**4**	**CO3**
Q 3	Specify the reagents required for the following reactions: a. $CH_3(CH_2)_{16}COOH \xrightarrow{?} CH_3(CH_2)_{16}CH_2OH$ b. $C_6H_5CH_2CH_2C_6H_5 \xrightarrow{?} C_6H_5COCOC_6H_5$	**4**	**CO1**
Q 4	Carry out following conversions: a. Phenyl hydrazine to indole. b. Piperdine to pyridine.	**4**	**CO2**
Q 5	What will be the stereochemistry of the final product 'B' in the following sequence? $CH_3C{\equiv}CCH_3 \xrightarrow{Lindlar's\ catalyst} A \xrightarrow{Prevost\ reagent} B$	**4**	**CO1**

SECTION B **(4Qx10M= 40 Marks)**			
Q 6	What happens when: a. 1-chloronaphthalene is treated with nitric acid in the presence of sulfuric acid? b. 2-naphthol is treated with chlorine in the presence of anhydrous $AlCl_3$? c. 1-acetonaphthalene is treated with sulfuric acid? Justify the formation of products in the above cases.	**10**	**CO2**
Q 7	Discuss the conversion of benzene to DDQ with all the necessary steps. **OR** Write a note on peracids, with at least 5 reactions reflecting oxidation in their presence.	**10**	**CO2**
Q 8	Draw the structure of isatin and show amido-imido tautomerism in it. How can it be converted to a natural pigment? Draw the structure of this pigment also.	**10**	**CO2**
Q 9	Give reasons: a. Quinoline is basic in nature. b. While its reduction in the presence of Sn/ HCl quinoline shows reduction in the ring containing N. c. Isoquinoline on nitration causes nitration in the ring which does not contain N. Also write the mechanism of this reaction.	**2.5+2.5+5**	**CO2,** **CO2,** **CO3**
SECTION-C **(2Qx20M=40 Marks)**			
Q 10	a. Complete the following reactions: i)  ii)  b. Identify the following reaction and complete its mechanism: 	**10+10**	**CO2,** **CO3**

Q 11	a. What happens when glycerol is heated with aniline in the presence of sulfuric acid and nitrobenzene? Name this reaction and write its mechanism also. b. Pyridine on reaction with methyl iodide gives N-methyl pyridinium iodide. What information do you receive from this reaction about pyridine? **OR** a. Cinnamaldehyde on treatment with hydroxyl amine gives a compound A, which undergoes rearrangement to produce another compound B. B on reaction with phosphorus pentoxide produces isoquinoline. Complete the reaction. Also identify the rearrangement used during the process and write its mechanism also. b. Quinoline on oxidation in the presence of alkaline $KMnO_4$ gives quinolinic acid and oxalic acid. What information do you receive from this reaction about quinoline?	**15+5**	**CO3**