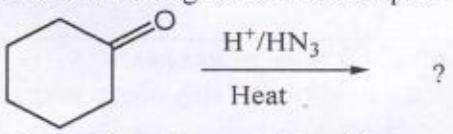
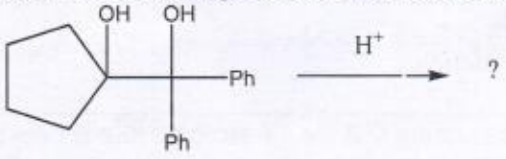
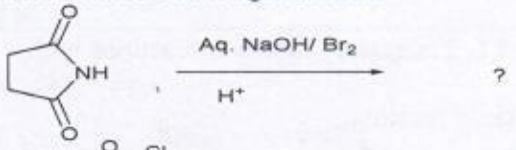
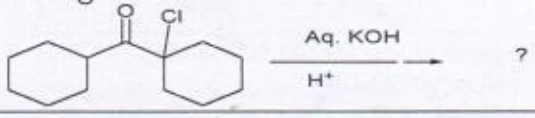
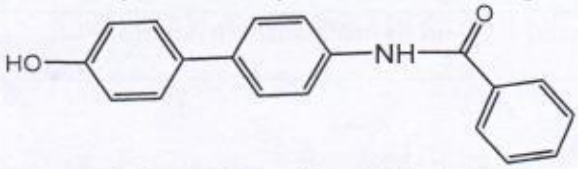
MANIPAL
ACADEMY of HIGHER EDUCATION
(Institution of Eminence Deemed to be University)

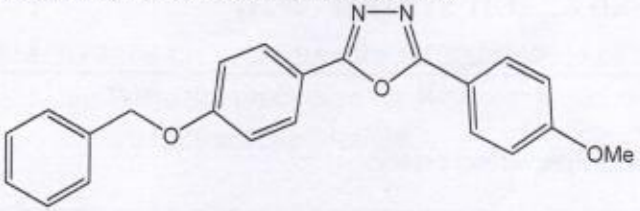
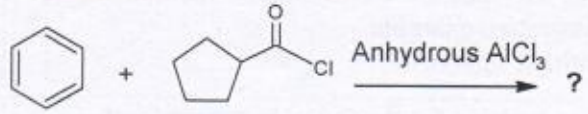
Reg. No.									

DEPARTMENT OF SCIENCES
III SEMESTER M.Sc. (CHEMISTRY)
END SEMESTER REGULAR EXAMINATIONS, NOV-DEC 2023
SUBJECT: ADVANCED ORGANIC CHEMISTRY – I [CHM 6151]
(CHOICE BASED CREDIT SYSTEM - 2021)

Time: 3 Hours Date: 30/11/2023 MAX. MARKS: 50

Note (i) Answer ALL questions.
(ii) Draw diagrams, and write equations wherever necessary

Q. No.	Question	Marks	CO	BL
1A	Explain the following named reactions with suitable mechanism. **i)** Wagner-Meerwein rearrangement **ii)** Benzilic acid rearrangement	2+2	CO1	L3
1B	**i)** Write the product in the following reaction and explain the mechanism.  **ii)** Write the product in the following reaction with reasoning. 	2+2	CO1	L3
1C	Predict the product in the following reactions: **i)**  **ii)** 	2	CO1	L3
2A	**i)** What is 1,4-diX relationship? Explain the retrosynthetic method for 1,4-diX compounds with an illustrative example. **ii)** Why is FGI used in retrosynthetic analysis?	3+1	CO3	L3
2B	**i)** Suggest suitable retrosynthetic analysis for the following compound.  **ii)** Discuss the retrosynthetic strategies for substituted indoles.	2+2	CO3	L3

2C	Explain the general retrosynthetic strategy for 1,1-bifunctional compounds	2	CO3	L2
3A	Predict all the possible disconnections and suggest a synthetic scheme with reasoning for the following molecule. 	4	CO3	L4
3B	**i.** Describe the mechanism of Riemer-Tiemann reaction. **ii.** What is Diels-Alder reaction? Explain the effect of substituents on the rate of the reaction.	2+2	CO2	L3
3C	Write a note on one group and two group C-X disconnection strategies.	2	CO3	L2
4A	i) What is hydrosilylation of olefins? Describe its mechanism. ii) Explain the catalytic cycle for the oxidation of ethylene to ethanal.	2+2	CO5	L3
4B	i) Explain dissociative and associative interchange mechanisms to explain ligand substitution reaction. ii) Explain Fischer-Tropsch reaction.	2+2	CO5	L3
4C	Determine the value of "n", assuming that the 18-electron rule is obeyed by the following complexes. **a)** $Cu(C_5H_5)(CO)_n$ **b)** $[V(CO)_n]^{1-}$ **c)** $[Mo_2(CO)_n]^{2-}$ **d)** $Fe(CO)_nH_2$	2	CO5	L4
5A	**i.** Differentiate between 1, 1 and 1, 2 migratory insertion reactions with suitable examples. **ii.** Explain the mechanism of Wittig reaction.	2 2	CO5 CO2	L3 L3
5B	Predict the product and write the mechanism for the following. **i.** $HC\equiv\!-R \xrightarrow{HCN,\ Ni(cod)_2} ?$ **ii.** 	2+2	CO2	L4
5C	What is the olefin metathesis? Explain its mechanism in detail.	2	CO5	L3

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