LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

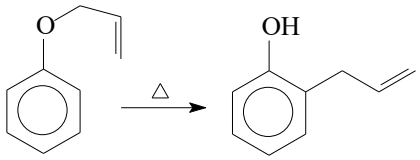
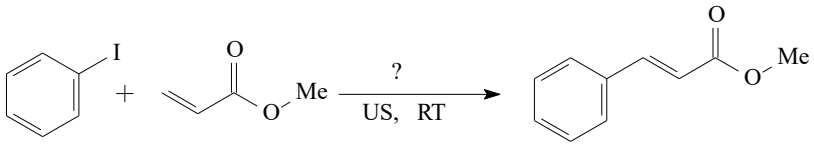
M.Sc. DEGREE EXAMINATION – **CHEMISTRY**

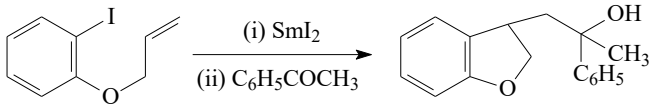
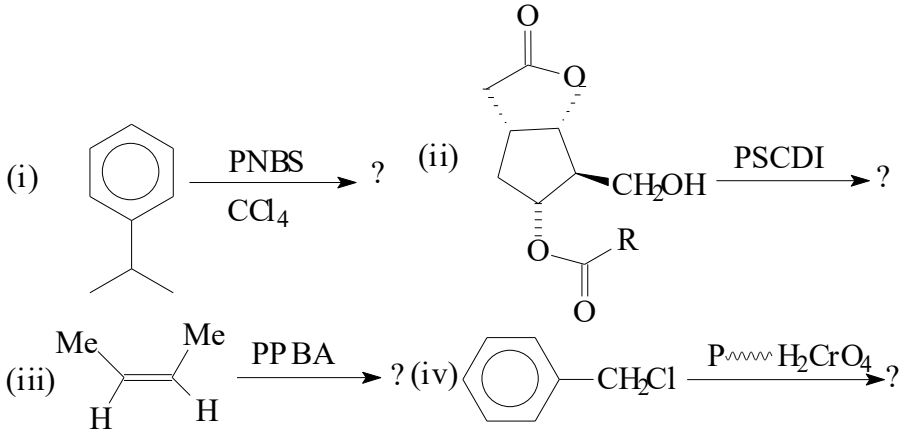
THIRD SEMESTER – **APRIL 2025**

PCH3ME01 – APPLIED ORGANIC CHEMISTRY

Date: 07-05-2025 Dept. No. Max. : 100 Marks

Time: 09:00 AM - 12:00 PM

	SECTION A – K1 (CO1)
	Answer ALL the questions **(5 x 1 = 5)**
1	**MCQ**
a)	Starch suspension is an example of _____ fluid flow. (i) pseudoplastic (ii) dilatant (iii) rheopectic (iv) Newtonian
b)	Which among the following reagent is used in the Simon-Smith reaction? (i) ICH_2ZnI (ii) $(CH_3)_2CuLi$ (iii) SmI_2 (iv) mCPBA
c)	Which of the following is a Moffatt oxidation reagent? (i) Poly-N-bromo succinimide (ii) Polystyrene thiomethyl lithium (iii) DMSO and Dicyclohexyl carbodiimde (iv) None of these
d)	The percentage of atom economy of the following reaction is  (i) 25 % (ii) 50 % (iii) 75 % (iv) 100 %
e)	The reagent/s used for the following ultrasonic assisted organic synthesis is/are----------.  (i) N-Methylpropylidone/Pd-C (ii) $PdCl_2$/TEA (iii) CH_2I_2/Zn/THF (iv) $CHCl_3$/NaOH
	SECTION A – K2 (CO1)
	Answer ALL the questions **(5 x 1 = 5)**
2	**True or False**
a)	Reynold's number is used in the fluid flow dynamics.
b)	Cyclohexenone on reaction with Gilman's reagent forms 1,4-additon product.
c)	Poly styrene is the most abundantly used polymer support in organic synthesis.
d)	Ionic liquids are made up of heterocyclic cations and large sized polyatomic anions.
e)	The frequency range for microwave radiation used for organic synthesis is 300 GHz to 3 KHz.
	SECTION B – K3 (CO2)
	Answer any THREE of the following **(3 x 10 = 30)**
3	(a) What is Reynolds's number? How are the types of flow observed in Reynolds's experiment? (b) What is boiling point diagram and mention its significance in the distillation processes? (6 + 4)
4	Explain the following reactions with suitable examples: (i) McMurray olefination (ii) Acyl anion reaction (5 + 5)
5	Organize the requirements to be a best polymer support for an organic synthesis highlighting the properties and advantages.
6	Illustrate the significance of ionic liquid as solvent in organic synthesis with examples.
7	Explain any five ultrasonic assisted organic synthesis.

	SECTION C – K4 (CO3)	
	Answer any TWO of the following	**(2 x 12.5 = 25)**
8	(a) What are the types of flow in fluid dynamics and give an example for each. (b) Draw a complete set of continuous fractionating column with rectifying and stripping sections.	(4.5 + 8)
9	(a) Give any two synthetic applications each of organocadmium and organocopper. (b) Give the mechanism of the following conversion. 	(4 + 4) (4.5)
10	(a) List the twelve principles of green chemistry. (b) Outline the synthetic applications of levulinic acid obtained from the waste biomass.	(6) (6.5)
11	(a) Explain the advantages of the following microwave assisted organic synthesis. (i) Ritter reaction (ii) Suzuki reaction (b) Explain the microwave assisted C- & N-alkylation and condensation of active methylene compounds.	(3 + 3) (6.5)
	SECTION D – K5 (CO4)	
	Answer any ONE of the following	**(1 x 15 = 15)**
12	(a) Explain the processes involved in the industrial production of aspirin. (b) Explain the following with suitable examples. (i) olefin metathesis (ii) ketyl-alkene coupling reactions	(8) (4 + 3)
13	(a) Compare the salient features of conventional heating and microwave heating. (b) Write any four organic reactions that are carried out in an aqueous medium.	(7) (8)
	SECTION E – K6 (CO5)	
	Answer any ONE of the following	**(1 x 20 = 20)**
14	(a) What are the challenges of pilot plant scale up processes? (b) Predict the product for the reaction of the following substrate with CH_3MgBr addition followed by hydrolysis. (i) $HC(OC_2H_5)_3$ (ii) $HCONR_2$ (iii) CH_3Br (iv) H^+	(4) (4 × 4)
15	(a) How would you convert 1-chloro octane into 1-cyano octane? Explain the salient features of this reaction with mechanism. (b) Predict the product and outline the best method to carry out the following reactions. 	(10) (4 x 2.5)
