LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

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

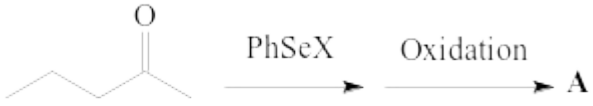
THIRD SEMESTER – **NOVEMBER 2024**

PCH3ME01 – APPLIED ORGANIC CHEMISTRY

Date: 19-11-2024 Dept. No. Max. : 100 Marks

Time: 01:00 pm-04:00 pm

	SECTION A – K1 (CO1)	
	Answer ALL the questions	**(5 x 1 = 5)**
1	**MCQ**	
a)	_____ are an example for the Newtonian fluid flow. (i) Paints (ii) Gypsum suspensions (iii) Gases (iv) Starch in water	
b)	Cyclohexenone on reaction with $(CH_3)_2CuLi$ forms_____. (i) 1,2-addition (ii) 1,4-addition product (iii) esters (iv) ethers	
c)	Which of the following polymer support can be easily functionalized? (i) Poly ethylene (ii) Poly propylene (iii) PVC (iv) Poly styrene	
d)	The percentage of atom economy of the following reaction is  (i) 25 % (ii) 50 % (iii) 75 % (iv) 100 %	
e)	The solvent-free organic synthesis can be performed in----------. (i) microwave assisted synthesis (ii) sonochemistry (iii) mechano chemistry (iv) photochemistry	
	SECTION A – K2 (CO1)	
	Answer ALL the questions	**(5 x 1 = 5)**
2	**True or False**	
a)	Pilot scale-up is not a linear process.	
b)	ICH_2ZnI reacts with *cis*-2-butene forms non-stereospecific products.	
c)	The poly styrene carbodiimide (PSCDI) is used for diazo transfer reactions.	
d)	Super critical carbon dioxide can be readily compressible at room temperature.	
e)	The frequency range for ultrasonic waves are lesser than 20 KHz.	
	SECTION B – K3 (CO2)	
	Answer any THREE of the following	**(3 x 10 = 30)**
3	(a) Discuss the energy balance in steady flow process. (b) Write a note on types of agitators and mixers.	(5) (5)
4	Explain the following reactions with suitable examples: (i) Pinacolic coupling reactions (ii) McMurray olefination	(5 + 5)
5	Making use of the polymer support, explain the advantages of the following organic synthesis: (i) Bromination by PNBS (ii) Oxidation by PSCDI	(5 + 5)
6	Illustrate the significance of water as solvent in organic synthesis with examples.	

7	Explain any five microwave assisted organic synthesis.
	SECTION C – K4 (CO3)
	Answer any TWO of the following **(2 x 12.5 = 25)**
8	(a) Explain the process involved in the continuous fractionating column with rectifying and stripping sections. (7.5) (b) What are the challenges of pilot plant scale up processes? (5)
9	(a) Give any two synthetic applications of organocadmium and organocopper. (8) (b) Discuss the synthetic applications of SmI_2 in organic synthesis. (4.5)
10	Describe the twelve principles of green chemistry in detail.
11	(a) Explain the mechanism of a phase transfer catalyzed reaction and highlight the advantages. (6.5) (b) "Sonochemical reactions are beneficial to conventional heating". Justify. (6)
	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. (10) (b) Write Bernoulli equation and give its significance in the fluid flow dynamics. (5)
13	(a) List the differences between conventional heating and microwave heating? (7) (b) Compare the traditional and greener methods of synthesis of Ibuprofen. (8)
	SECTION E – K6 (CO5)
	Answer any ONE of the following **(1 x 20 = 20)**
14	(a) Identify A, B & C. Suggest suitable mechanism for the reaction. (3 × 5) (i)  (ii)  (iii)  (b) Mention the various types of fluid dynamics. Give one example for each. (5)
15	(a) Explain the phase diagram of supercritical CO_2. List the advantages and limitations of $scCO_2$ as solvent in organic synthesis. (10) (b) Write the following polymer supported organic synthesis. (4 × 2.5) (i) Intramolecular cyclization (ii) Wittig reaction (iii) Alkylation (iv) Photosensitization

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