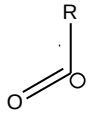
STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI-86
(For candidates admitted during the academic year 2023-24)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2024
BRANCH IV- CHEMISTRY
THIRD SEMESTER

COURSE : CORE
PAPER : SYNTHETIC ORGANIC CHEMISTRY AND NATURAL PRODUCTS
SUBJECT CODE : 23CH/PC/SO34
TIME : 3 HOURS MAX.MARKS :100

Q. No.	SECTION A (10 x 1 = 10 marks)	CO	KL
1.	Papaverine belongs to the class of natural products called _____. a) Alkaloids b) Terpenoids c) Steroids d) Natural Pigments	1	1
2.	Umpolung means a) Reversal of polarity b) Same polarity c) reverse reaction d) Equilibrium	1	1
3.	Ethylene glycol is used as a protecting group for a) Carbonyl group b) Amino group c) Hydroxyl group d) Carboxyl group	1	1
4.	The basic structural unit in anythocyanins is _____. a) γ-pyrone b) polyene c) benzpyran d) pyrrole	1	1
5.	Palladium catalyst is widely used in _____. a) Ziegler-Natta reaction b) Gilman reaction c) Simmons-Smith reaction d) Suzuki coupling	1	1
6.	The reagent used to convert CH_3COCH_3 into CH_3COOCH_3 is a) DDQ b) DCC c) $C_6H_5CO_3H$ d) OsO_4	1	1
7.	The synthetic equivalent for CH_3^- a) CH_3MgBr b) CH_3CN c) CH_3SO_2H d) CH_3Br	1	1
8.	What reagent converts a cyanide into a primary amine? a) H_2SO_4 b) NaOEt c) $LiAlH_4$ d) Perbenzoic acid	1	1
9.	Enolates adding to α, β-unsaturated carbonyl compounds is called _____ reaction. a) Claisen-Schmidt b) Knoevenagel c) Michael d) Perkin	1	1
10.	_____ can be used for the dehydrogenation of hydroaromatic compounds. a) DCC b) DDQ c) Tosyl chloride d) SeO_2	1	1

Q. No.	SECTION B (10 x 1 = 10 marks)	CO	KL
	Fill in the blanks	2	2
11.	_____ is the synthetic equivalent of 	2	2
12.	Anthocyanidins are the _____ part of anthocyanins.	2	2

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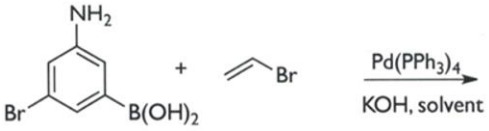
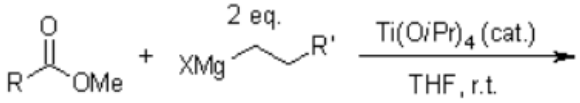
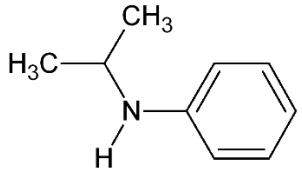
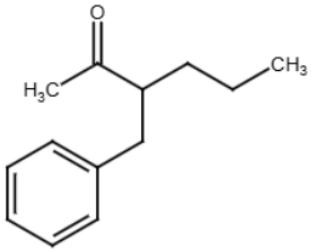
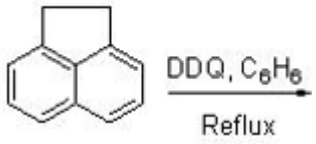
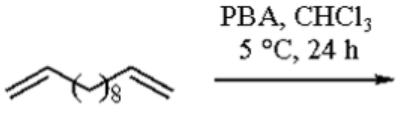
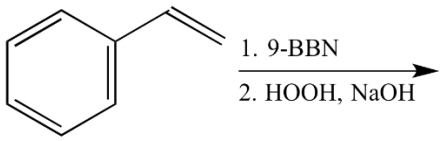
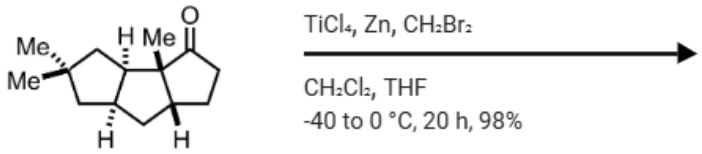
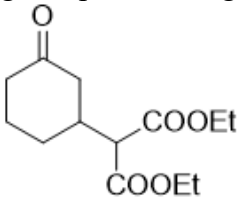
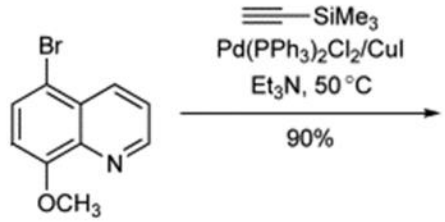
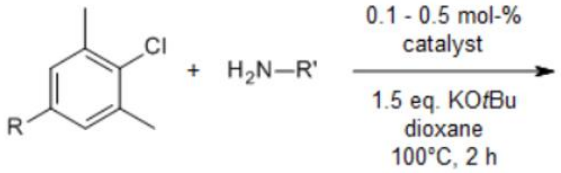
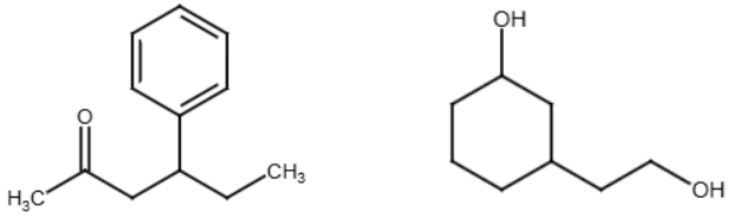
13.	NBS is used to brominate _____ positions in a molecule.	2	2
14.	Gilman reagent is _____.	2	2
15.	Acetic anhydride is used to determine _____ functional group in an alkaloid.	2	2
	Answer in a line or two.	2	2
16.	Define FGI.	2	2
17.	What is the isoprene rule?	2	2
18.	What is the Kuhn-Roth method?	2	2
19.	How can an alcoholic group be converted into a good leaving group?	2	2
20.	What is the application of the Ziesel's method?	2	2

Q. No.	SECTION C (4 x 6 = 24 marks)	CO	KL
	Answer any four questions.		
21.	Show how flavonoids can be distinguished by colour reactions.	3	3
22.	Illustrate how the position of the hydroxyl group and the angular methyl group in cholesterol can be determined.	3	3
23.	Complete the following reaction sequences. a.  b.  (3+3)	3	3
24.	Discuss any two synthetic applications of dicyclohexylcarbodiimide and Perbenzoic acid.	3	3
25.	Demonstrate with suitable examples how carbonyls and carboxylic acids can be protected and deprotected.	3	3

Q. No.	SECTION D (4 x 8 = 32 marks)	CO	KL
	Answer any four questions.		
26.	Identify the synthetic route for the following two compounds using the retro method. a. b.   (4+4)	4	4
27.	Outline the structural elucidation of daidzein.	4	4
28.	Predict the products of the following reactions. a.  b.  c.  d.  (4x2=8 marks)	4	4
29.	Analyse the Nozaki-Hiyami reaction and explain with mechanism.	4	4
30.	Discuss the general methods for the synthesis of anthocyanins.	4	4

Q. No.	SECTION E (2 x 12 = 24 marks)	CO	KL
	Answer the following questions.		
31.	a) Establish the structure of Zingiberene. (10) b) Predict the product of the following reaction. (2) 		

	(OR)	5	5
32.	a) Synthesise the following compound using Michael addition. (4)  b) Assess the following reactions and predict the products. (8) i.  ii.  iii..  (3+2+3)		

33.	a) Evaluate the use of sterically hindered bases to achieve the desired stereochemical outcome in the Aldol reaction. (7) b) Discuss the role of phenylisothiocyanate in the Edman degradation method with mechanism. (5)	5	5
	(OR)		
34.	a) Propose a retrosynthetic analysis and synthesis for the following compounds. (8) i. ii.  b) Identify the products obtained when the following compounds are fused with KOH. (4) i. Apigenin ii. Cyanidin chloride		

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