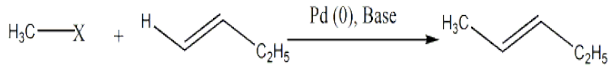
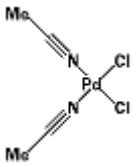
Duration: 3 hours **Total Marks: 75**

N.B.: 1. All questions are compulsory
2. Figures to right indicate full marks
3. Draw structures wherever required.

Q. I Attempt all multiple-choice questions (MCQ) **20 Marks**

Sr. No.	Questions		Options
1	E factor defined as the _____	a	mass ratio of waste to desired product
		b	mass ratio of reactant to desired product
		c	mass ratio of reagent to desired product
		d	mass ratio of catalyst to desired product
2	Different mechanisms are involved for heating in microwave synthesis are _____	a	Dipolar Polarization and convection mechanism
		b	Dipolar polarization and conduction mechanism
		c	Radiation and conduction mechanism
		d	Radiation convection mechanism
3	Identify the reaction 	a	Suzuki
		b	Shapiro
		c	Heck
		d	Wittig
4	PEG-PS composite is composed of	a	Polystyrene- Polyacrylamide composite
		b	Polystyrene- p-divinyl composite
		c	Polystyrene- polethylene glycol composite
		d	Polystyrene- polpropylene glycol composite
5	Choose the amino acid which can be involved in side chain reaction with carbodiimide	a	Ala
		b	Leu
		c	Ser
		d	Gly

6	Which of the following is not the side reaction in peptide synthesis	a	Acetylation
		b	Cyclization
		c	Hydrolysis
		d	Racemization
7	Which of the following reactions involves conversion of an allyl vinyl ether to unsaturated ketone?	a	Claisen Rearrangement
		b	Claisen condensation
		c	Cope rearrangement
		d	Diels- Alder Reaction
8	Which of the following is Green solvent?	a	Ethyl acetate
		b	Benzene
		c	Toluene
		d	Tetrahydrofuran
9	1,3,5-Hexatriene has _____ double bonds and _____ π molecular orbitals	a	Three, Six
		b	Three, Three
		c	Six, Six
		d	Six, Three
10	The branch of chemistry dealing with the study of the effect of ultrasound waves (20 KHz – 100 KHz), on chemical activity is known as	a	Flow chemistry
		b	Sonochemistry
		c	Microwave chemistry
		d	Click chemistry
11	Reaction between conjugated diene and dieneophile includes _____	a	Addition reaction
		b	Diels alder (4+2) cycloaddition
		c	Diels alder (6+2)cycloaddition
		d	Diels alder (2+2)cycloaddition
12	Identify odd option from following	a	Crown ethers
		b	Evans auxiliary
		c	(+) Ephedrine
		d	BINAP
13	Which of the following is not the method for catalytic deactivation	a	Poisoning
		b	Formation of deposits
		c	Sintering
		d	Absorption

14	Which of the following is not used as a support in heterocyclic catalysis?	a	Alumina, Silica, Zeolite
		b	Alumina, TiO2, Zeolite
		c	Zeolite, Carbon, Silica
		d	Alumina, Carbon, Sodium
15	Following complex _____  (Valence electron for Pd=10)	a	Satisfies 18 e^- rule, and is reactive
		b	Does not satisfy 18 e^- rule and is reactive
		c	Satisfies 16 e^- rule and is unreactive
		d	Does not satisfy 16 e^- rule and is unreactive
16	Organic mixture with composition of 50% each enantiomer is referred as ----------and is optically----------	a	Racemic mixture, active
		b	Racemic mixture, inactive
		c	Meso compound, active
		d	Meso compound, inactive
17	In Sharpless asymmetric epoxidation, substrate which delivers oxygen to the upper face of alkene is _____	a	D (+) diethyl tartrate
		b	L (+) diethyl tartrate
		c	D (-) diethyl tartrate
		d	L (-) diethyl tartrate
18	For enantioselective reduction of acetylenic ketone, chiral reagent preferred is _____	a	Darvon's alcohol in presence of $LiAlH_4$
		b	Baker's Yeast
		c	Psudomonas Pudita
		d	$LiAlH_4$
19	What will be the hapto number for following complex?  	a	1
		b	3
		c	4
		d	5

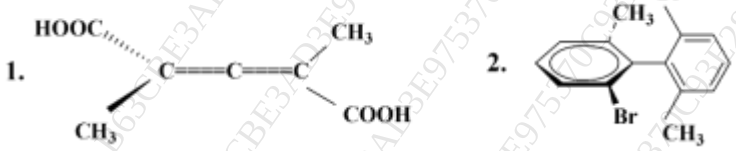
20	*ortho* substituted biphenyl exhibit chirality and it is known as_____	a	Enantiomer
		b	Atropoisomerism
		c	Geometric isomerism
		d	Diastereomer

Q. II Attempt any TWO questions **20 Marks**

1. a Discuss in detail the synthesis of Tyr-Phe-Gly-Val tetrapeptide by solid phase synthesis. 5 Marks

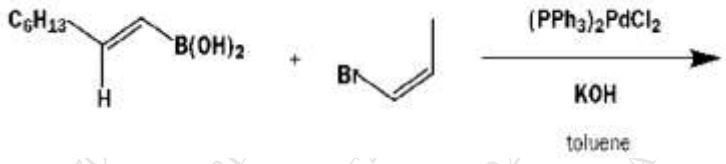
1. b What do you mean by enantiomeric excess? If enantiomeric yield has been reported as 88% calculate the enantiomeric excess. 3 Marks

1. c Assign R/S configuration for following: 2 Marks



2. a What is a Sigmatropic rearrangement reaction? Explain any two in detail 5 Marks

2. b Complete the following reaction. Name the reaction involved and explain its mechanism 5 Marks

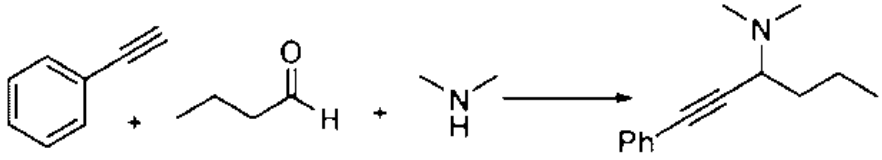


3. a What do you mean by homogeneous catalysis? Explain hydrogenation reaction by Wilkinson catalysis. 5 Marks

3. b Explain Sharpless asymmetric epoxidation with suitable example. 5 Marks

Q. III Attempt any SEVEN questions **35 Marks**

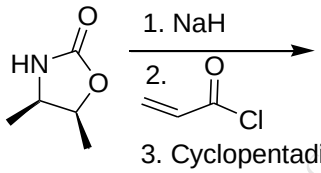
1. Enlist 12 principles of green chemistry. What do you mean by atom economy? Calculate atom economy for the following reaction. 5 Marks



2. Write note on coupling reagents used in Peptide synthesis. Explain how will you solve the problem of racemization during peptide synthesis. 5 Marks

3. Predict the products for following thermal ring closure. Identify the type of reaction. 5 Marks
i) (2E,4Z,6Z,8E)-2,4,6,8- decatetraene
ii) (2Z,4Z,6Z,8Z)-2,4,6,8- decatetraene

4. What do you understand by catalyst deactivation and poisoning? Discuss in detail. 5 Marks
5. What do you mean by chiral auxiliary? Name the chiral auxiliary used in the following reaction. Predict the product for the following. 5 Marks



3. Cyclopentadiene

6. Write a note on Phase transfer catalysis 5 Marks
7. Explain mechanism of [3,3] and [2,3] sigmatropic rearrangements with suitable examples 5 Marks
8. Explain with the help of a mechanism product formed when 2- methyl cyclohexanone through and intermediate hydrazone reacts with 2 moles of organolithium compound. 5 Marks
9 Explain in brief principle and applications of sonochemistry 5 Marks

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