THE UNIVERSITY OF TOLEDO 1872

CHEM 8410_6410_4410 Spring 2019 – Mid-Term Exam 2
03-12-19

Time: 10:00am – 11:15am

ANSWERS

Student Name: _____

Student Number: _____

Instructor:	Prof. Andreana
Room #:	BO 2059

Mid-Term Exam 2

Time: 10:00 am – 11:15 am
Date: March 12, 2019
Room: BO 2059

100 Points - Total

Problem 1: Please provide mechanisms for 5 of the following 10 named reactions: (**25 Points**) - * indicates this named reaction MUST be one of your 5.

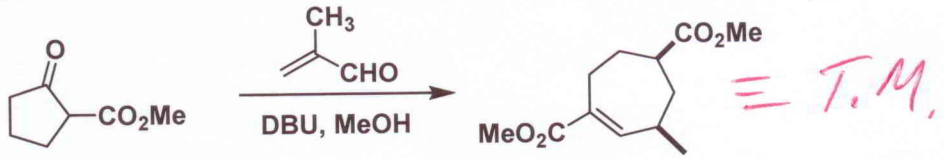
- Blaise Reaction
- Borsche-Drechsel Cyclization
- Clemmensen Reduction
- *Dess-Martin Oxidation
- Edman Degradation
- Dakin West Reaction
- Cope Elimination Reaction
- *Chichibabin Reaction
- Brook Rearrangement
- Cannizzaro Reaction

Answer(s):

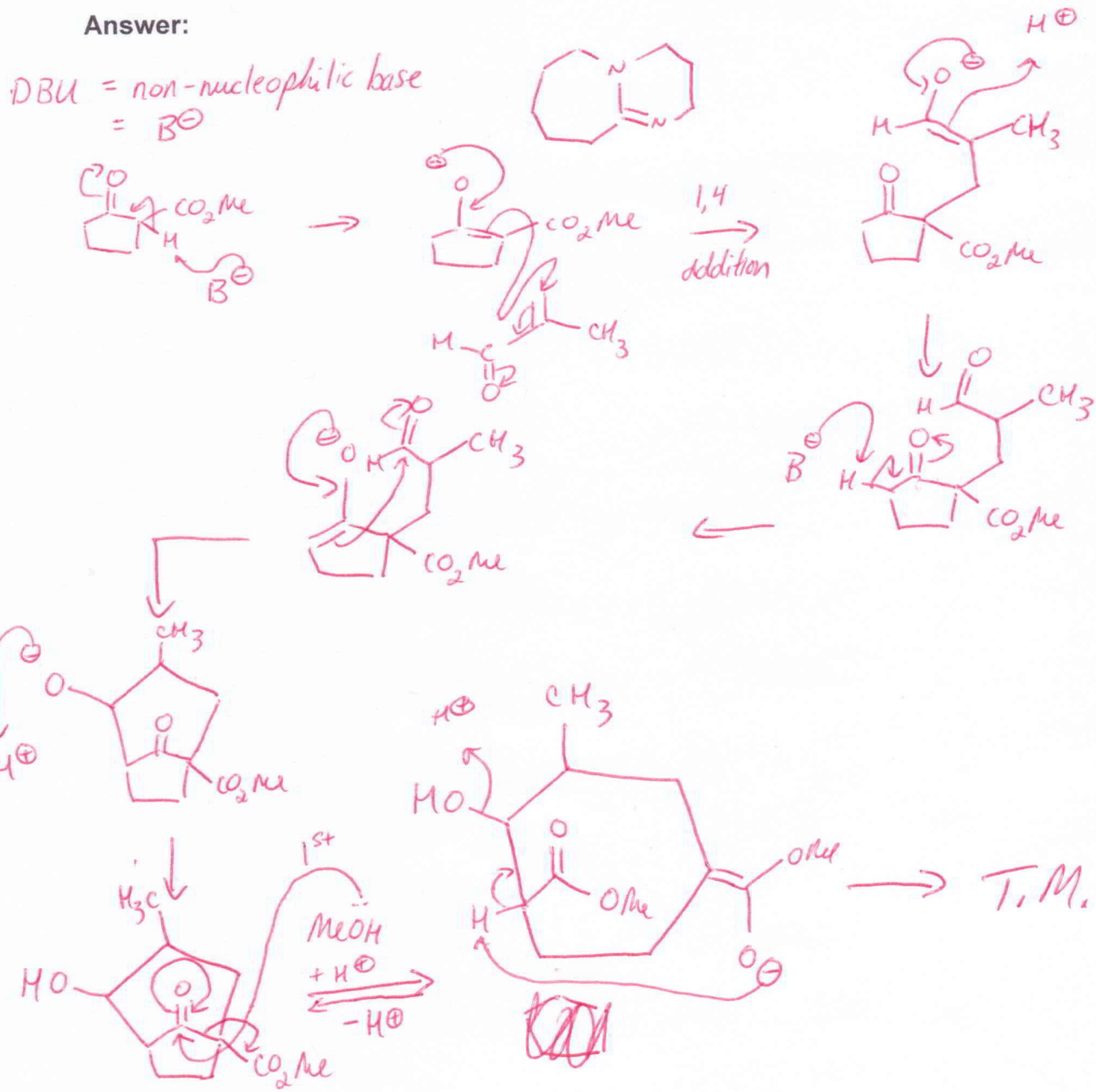
PLEASE SEE YOUR NOTES

Use back of sheet if need be and blank paper→→→→→→→→→→→→→→→→→→→→→→→

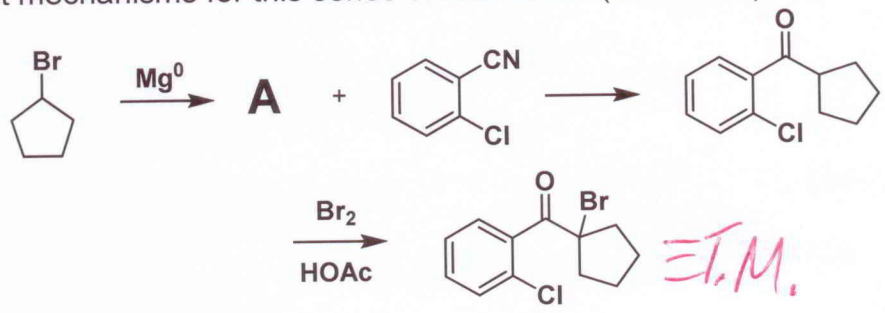
Problem 2: Please provide a mechanism for the following reaction transformation. (**20 Points**)



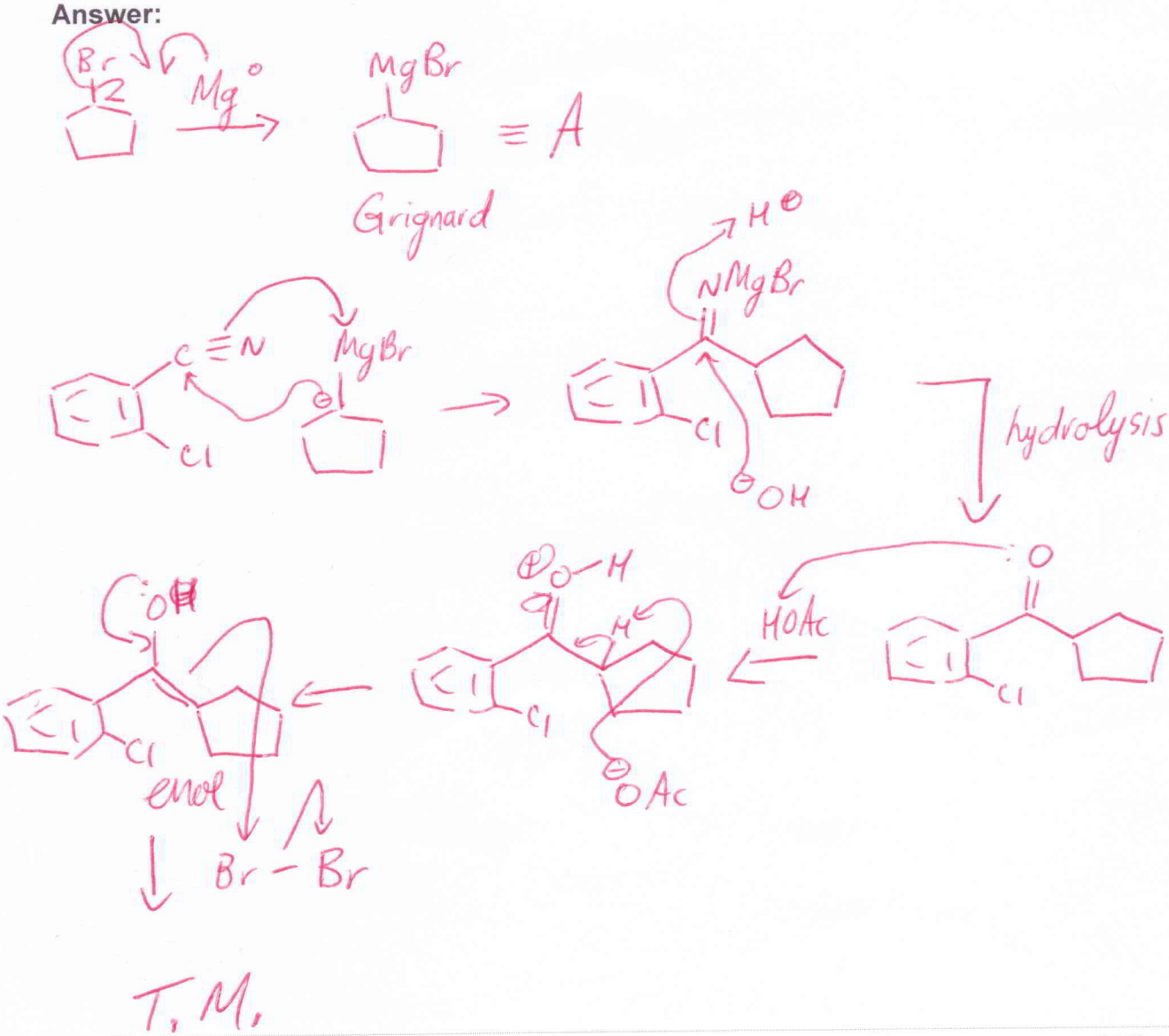
Answer:



Problem 3: Suggest mechanisms for this series of reactions. (**20 Points**)

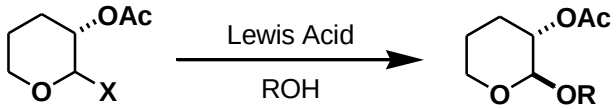


Answer:



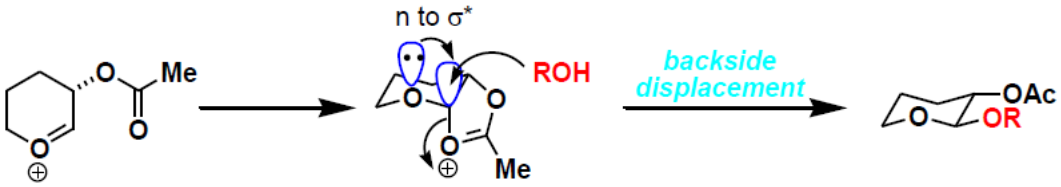
Problem 4: Stereoselective formation of the glycosidic linkage is the principal challenge in the synthesis of biologically important oligosaccharides. Anchimeric assistance (neighboring group participation) can be a powerful tool for the selective construction of glycosidic bonds. (**25 Points**)

Part A. For the following α-selective glycosylation, please provide a clear mechanism, using three-dimensional representations, that accounts for the observed stereochemical outcome. Indicate all relevant orbital interactions.



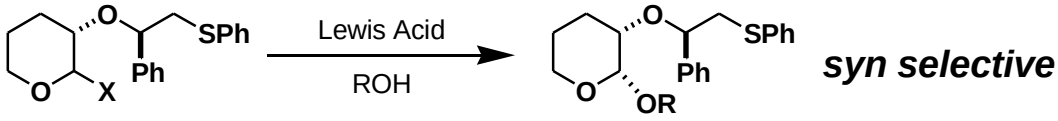
X = activating group

Answer:



stereoelectronically favored intermediate

Part B. Boons and co-workers (JACS, 2005) reported a highly selective synthesis of the corresponding syn di-substituted system by employing a participating phenyl-2-(phenylsulfanyl)ethyl moiety, as indicated below. Using three-dimensional drawings, provide a rational mechanism for this interesting reaction. Be sure to indicate all favorable and unfavorable interactions, both steric and electronic. N.B: This reaction is under kinetic control.



syn selective

X = activating group

Answer: