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III Semester M.Sc. Degree Examination, April/May - 2022

## CHEMISTRY

Organic Synthesis

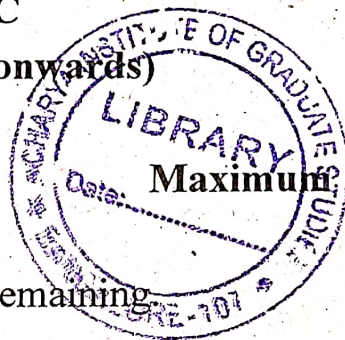
Paper : CH - 302 OC

(CBCS Scheme 2019-2020 onwards)

Time : 3 Hours

Instructions to Candidates:

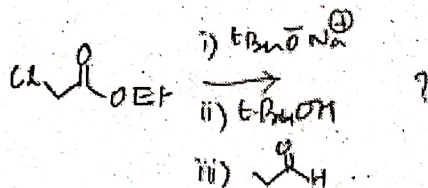
1. Answer question No. 1 and any 5 from the remaining
2. Figures to the right indicate marks.



1. Answer any Ten of the following.

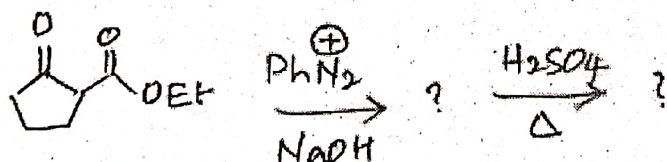
(10×2=20)

a. Predict the product in the following reaction.

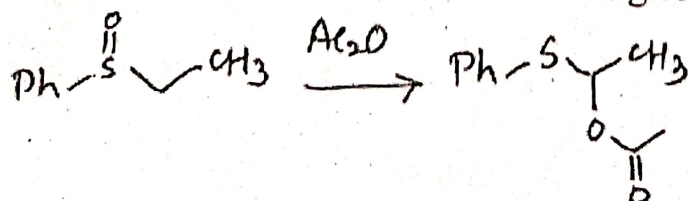


b. What is shapiro reaction? Give an example.

c. Identify the product in the following protocol.



- d. What happens when cyclohexene is reacted with NBS followed by water work-up?
- e.  $\text{PhCOOH} + \text{PhNH}_2 \xrightarrow{\text{DCC}} ?$
- f. Give an example for oppenauer reaction.
- g. What happens when Anisole is subjected to Birch reduction?
- h. Outline the steps involved in the following conversion.



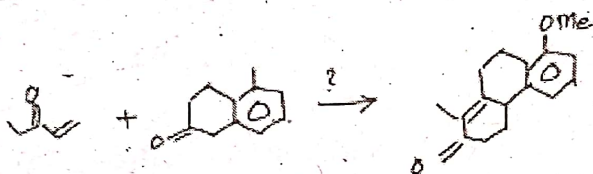
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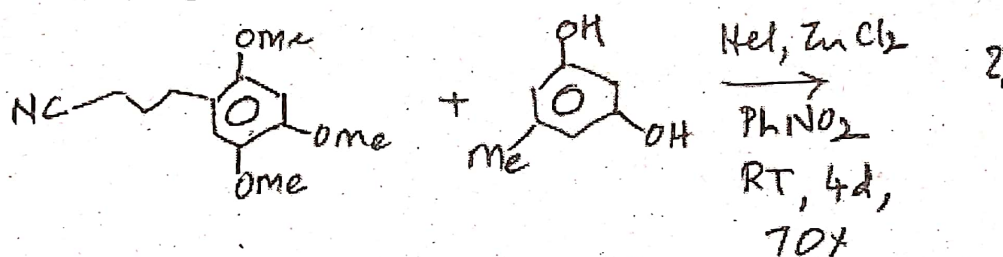
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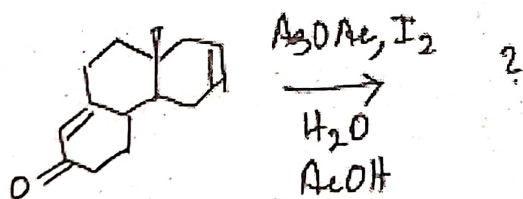
- i. Give an example for Wolff-kishner reduction.
  - j. Calculate the composition of R and S in terms of percentage if a product obtained by an enantioselective reaction is 95% ee.
  - k. Explain whether bromination of cyclohexene is stereoselective or stereospecific?
  - l. Define Asymmetric amplification. Give an example.
2. a. Predict the reagent and out line the mechanism involved in the following transformation.



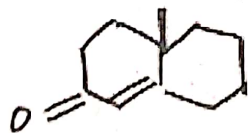
- b. What is Hofmann -Martius rearrangement? Discuss its mechanism.
- c. Predict the product with a suitable mechanism for the following reaction. (3+3+4=10)



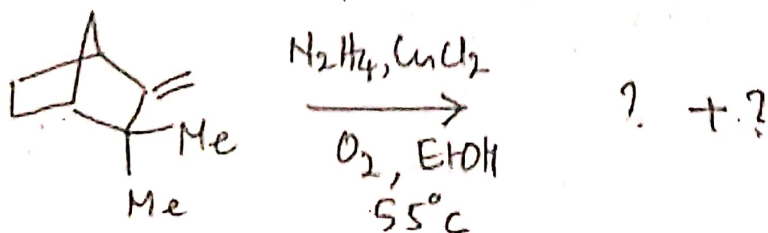
3. a. Discuss the synthetic applications of 1,3 - Dithiane.
- b. Predict the product with suitable mechanism for the following reaction.



- c. What happens when the following compound is reacted with DDQ? (4+3+3=10)



4. a. Predict the product(s) in the following reaction.





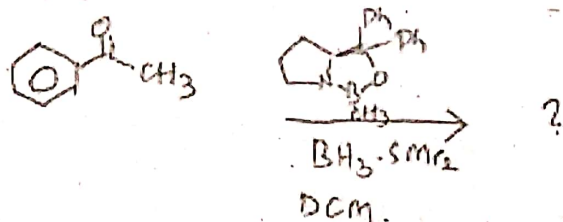
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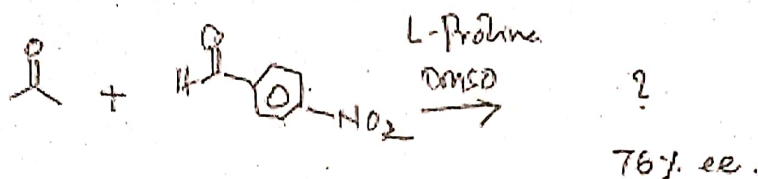
b. Give an example of McMurry reaction, explain with a mechanism.

c. Predict the stereochemistry of the product.

(3+3+4=10)



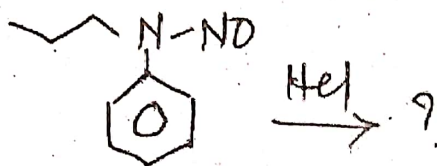
5. a. Predict the stereochemistry of product in the following aldol reaction.



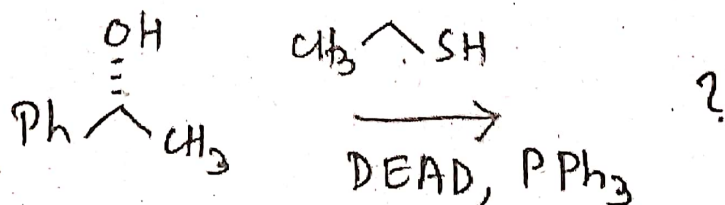
b. Discuss the synthetic application of (S)-BINAL.

c. Write a note on polymer-bound chiral catalysts in asymmetric induction. (3+3+4=10)

6. a. Predict the product with steps involved in the following reaction.



b. Identify the product and give the mechanism for the following protocol. (4+6=10)

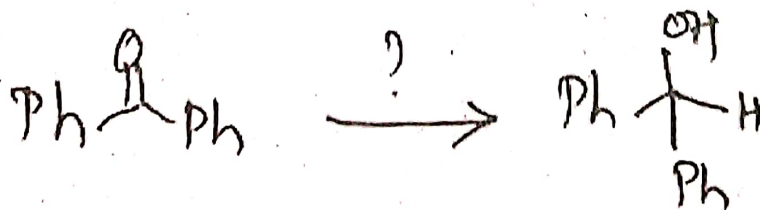


7. a. Discuss the synthetic applications of Corey - Chaykovsky reagent.

b. What is Dess - Martin oxidation? Give any two uses.

(6+4=10)

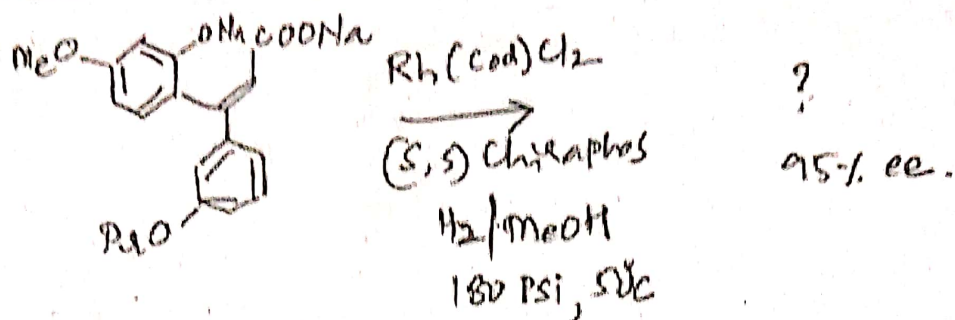
8. a. How the following transformation can be accomplished? Explain with mechanism.



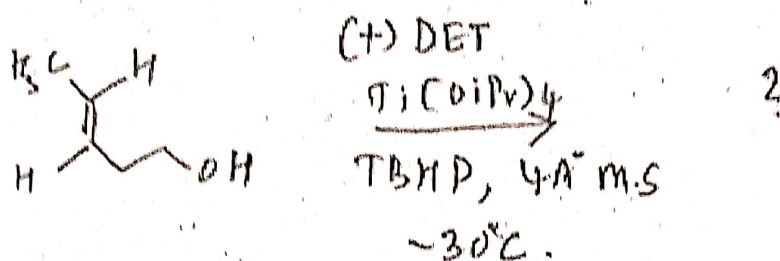
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b. Predict the stereochemistry of the product in the following reaction



c. Predict the stereochemistry of epoxide formed in the following stereoselective reaction



(3+3+4=10)