

M. SC. (Organic Chemistry) Sem-III (Choice Based Credit & Grade System) : SUMMER - 2019

SUBJECT : ADVANCED STEREOCHEMISTRY

Day : Saturday  
Date : 04/05/2019

S-2019-1182

Time : 03.00 PM TO 06.00 PM  
Max. Marks : 60

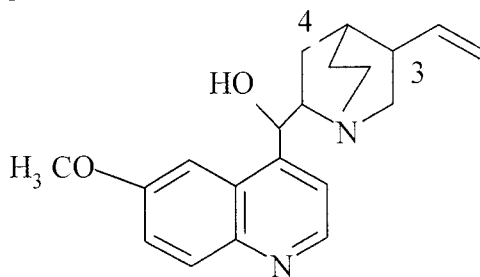
N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in **SAME** answer book.

SECTION - I

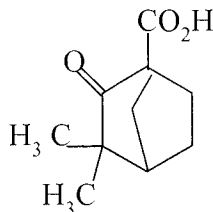
Q.1 Attempt ANY THREE of the following: [15]

- a) Draw conformational stereostructures of the trans-syn-trans perhydroanthracene and *cis*-anti-*cis* perhydroanthracene. Calculate their energy in terms of butane-gauche interactions and explain their optical activity.
- b) Give the experimental evidences to establish relative configuration of C<sub>3</sub> and C<sub>4</sub> in the following compound (I).



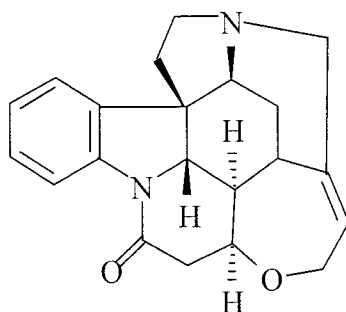
(I)

- c) The camphenonic acid (II), although it is  $\beta$ - keto acid, do not readily decarboxylate. Explain.



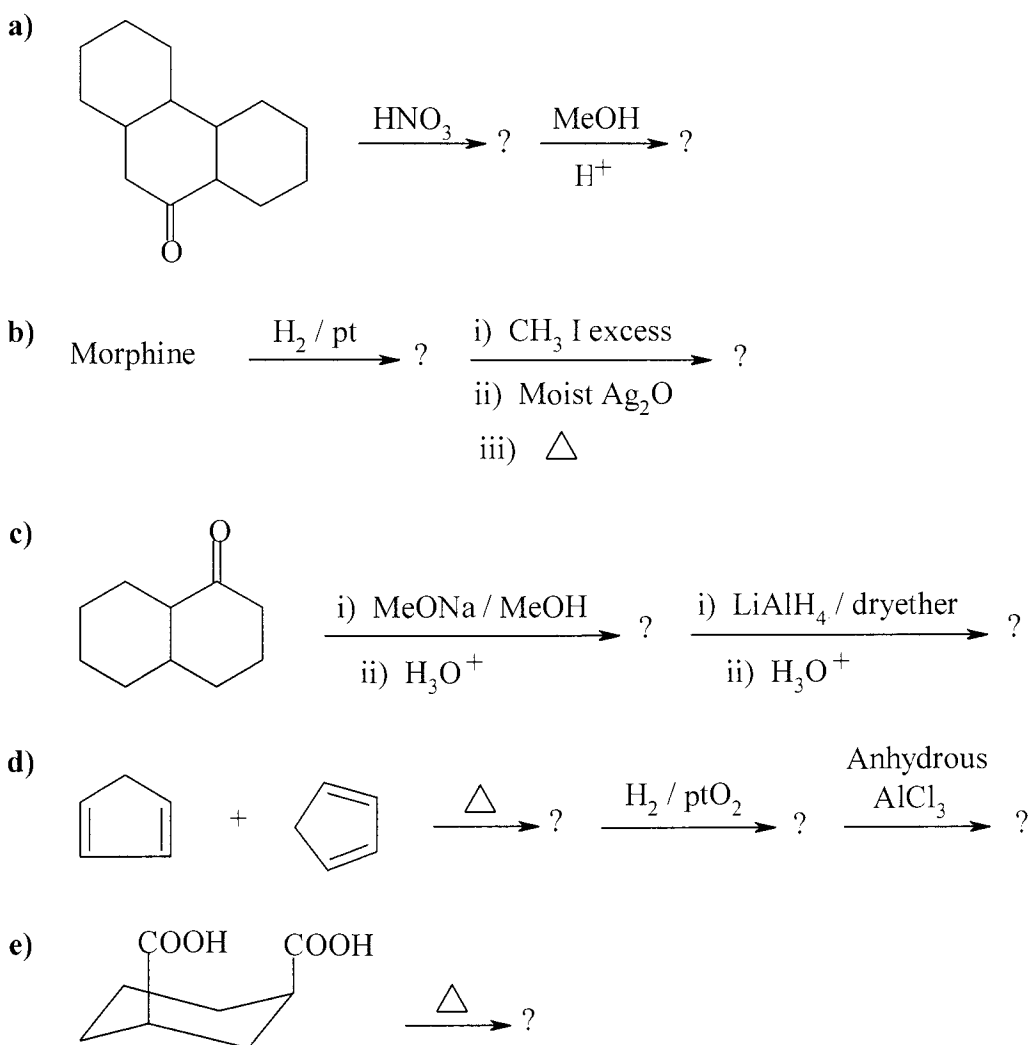
(II)

- d) Draw conformational structures of the *cis*-hydrindane and *trans*-hydrindane. Give their IUPAC names and explain their optical activity.
- e) Draw stereostructure of (-) strychnine and mention chiral centers.



P.T.O.

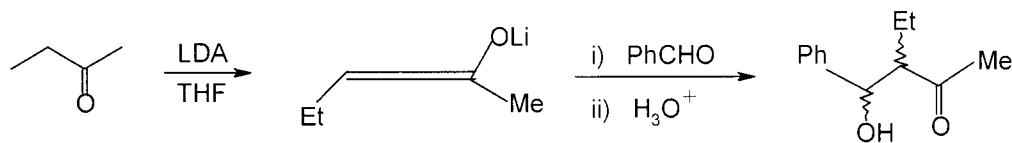
**Q.2** Predict the product/s in **ANY THREE** of the following and discuss the [15]  
stereochemical principles involved in them:



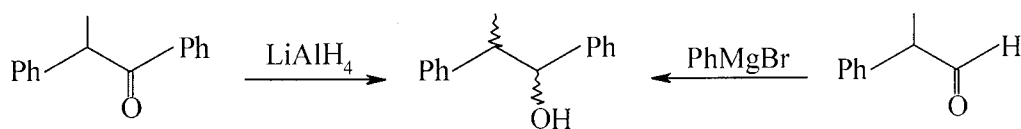
### SECTION – II

**Q.3** Attempt **ANY THREE** of the following: [15]

- a) Which enantiomer is formed when the methyl magnesium bromide attacks the Re face of each of the following carbonyl compounds?  
 i) 2-pentanone      iii) benzaldehyde      v) Acetophenene  
 ii) Propiophenone      iv) 3-hexanone
- b) For the following aldol-type reaction which product (syn/anti) is expected to be major? Why? Draw Zimmerman-Traxler T.S. to explain your answer.

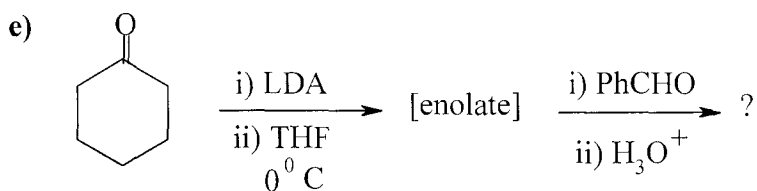
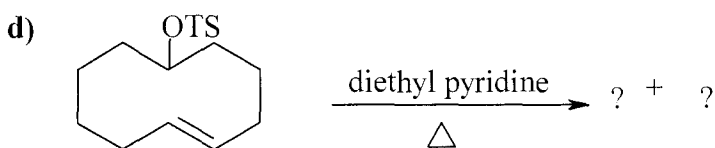
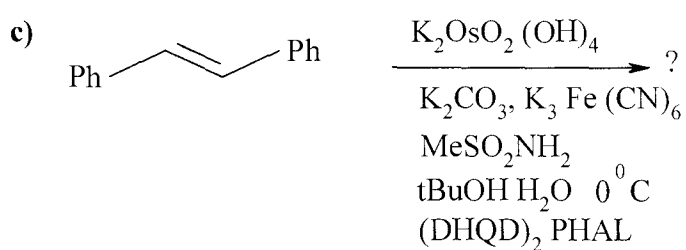
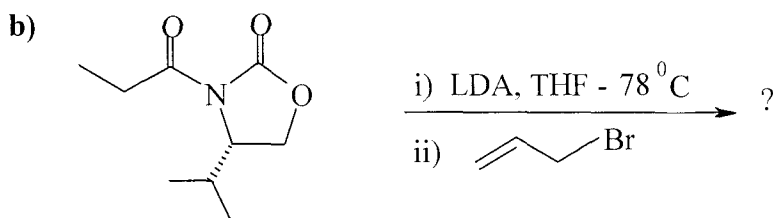
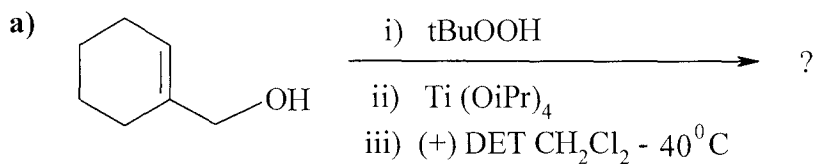


- c) Explain with suitable examples the concept of I-strain.
- d) Explain how these two reactions give different diastereomers of the product.



- e) Cyclohexyltrimethyl ammonium hydroxide as well as cyclohexyl dimethylamine oxide on pyrolysis gives only cyclohexene. Explain.

**Q.4** Predict the product/s in **ANY THREE** of the following. Draw the [15] stereostructure of products. Justify your answer:



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