

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

SUBJECT : CHEMISTRY OF NATURAL PRODUCTS

Day : Thursday
Date : 25/04/2019

S-2019-1194

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

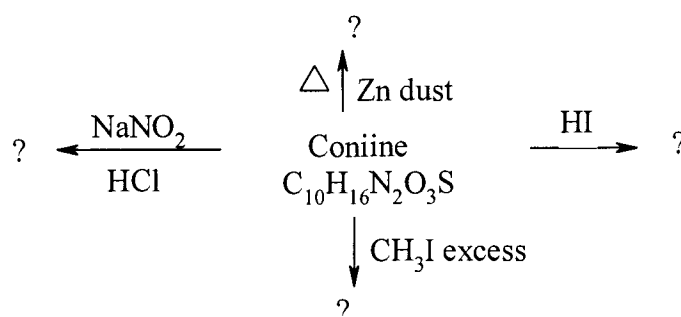
N.B.:

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

SECTION - I

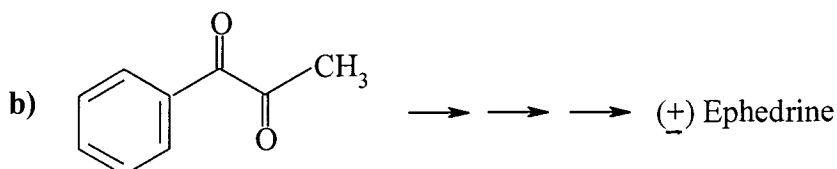
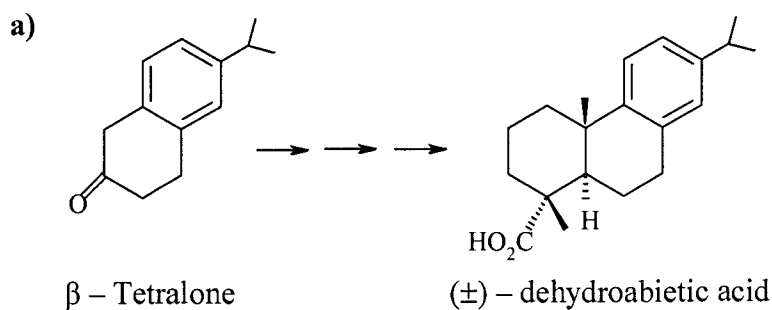
Q.1 Answer ANY THREE of the following: [15]

a) Write down the products in the following reactions:

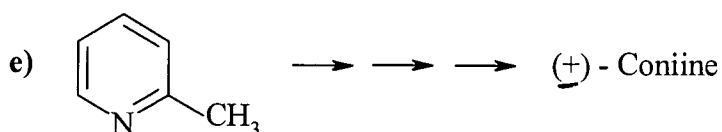
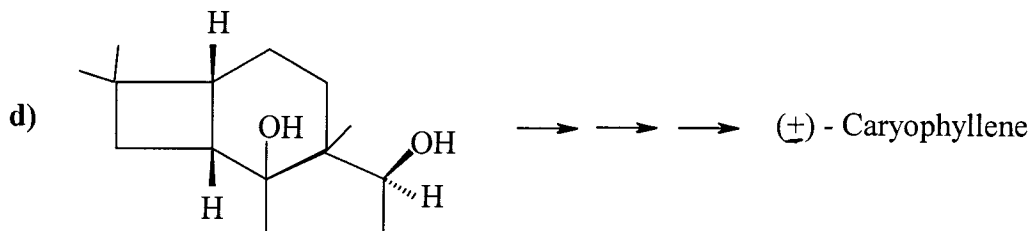
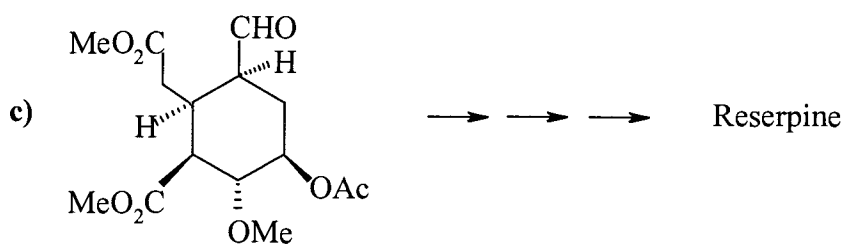


- b) How you will prove the presence of double bonds and number of rings in Caryophyllene.
- c) Give the evidences to prove the presence of the following in morphine:
 - i) Nature of oxygen atoms
 - ii) Presence of phenanthrene nucleus
 - iii) Presence of the nitrogen atom in the ring
- d) Give all the evidences to prove the structure of zingiberene.
- e) How will you prove the presence of γ -lactone, α , β - unsaturated ketone and tricyclic nature in santonin?

Q.2 Complete ANY THREE of the following sequences. Indicate the reagents used [15] and discuss the mechanism, stereochemistry involved.



P.T.O.

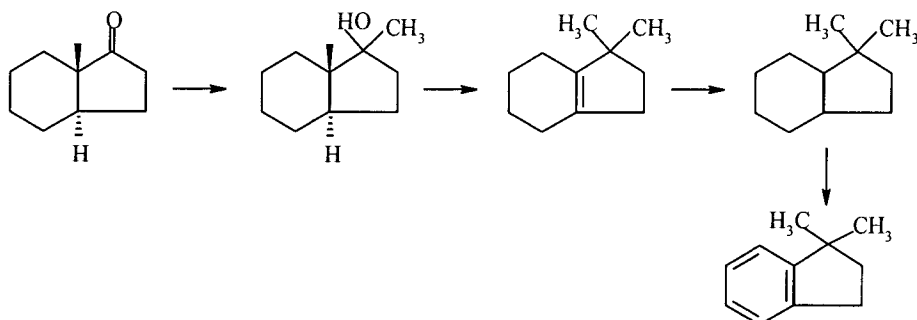


SECTION - II

Q.3 Answer ANY THREE of the following:

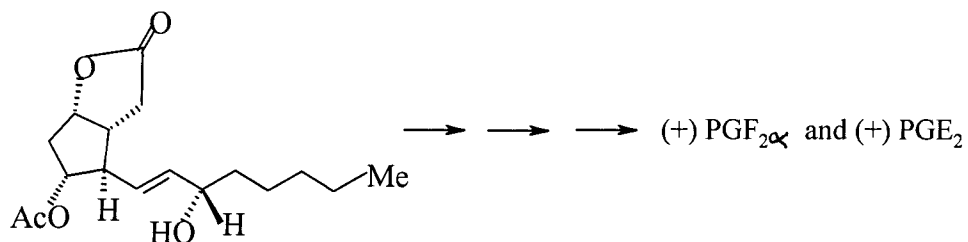
[15]

- a) Arrange the reagents given below to accomplish the following transformation. Explain the mechanism for each step:

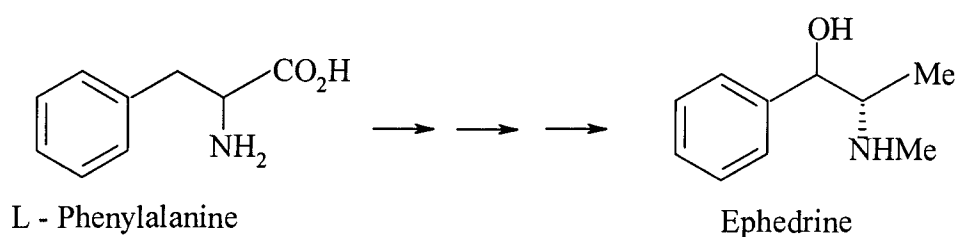


- i) KHSO_4 ii) Se / Δ iii) CH_3MgBr iv) H_2 / Pt

- b) Outline the steps in the following synthetic sequence. Indicate the reagents used and discuss the mechanism and stereochemistry.

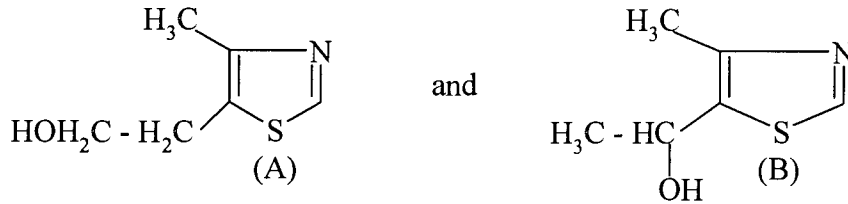


- c) Suggest biogenetic scheme for the following:



...3...

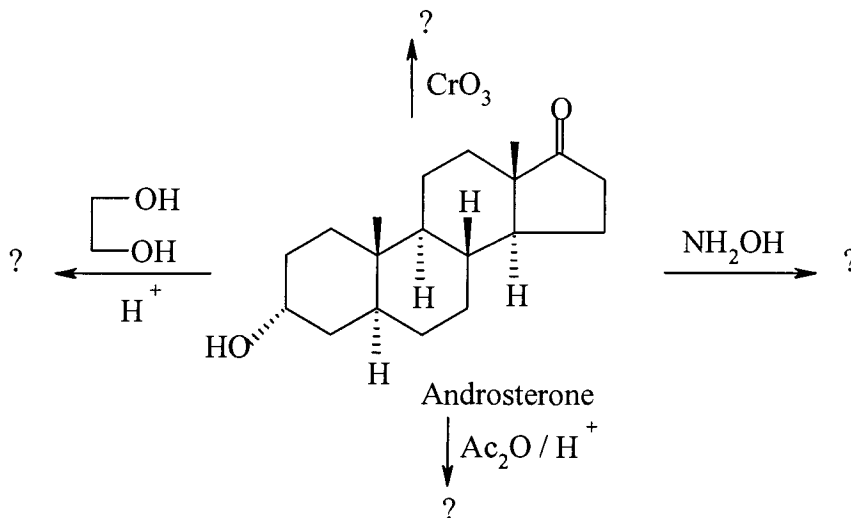
- d) The structures of two isomeric thiazole derivatives are as follows. Which will show positive iodoform test and which will be optically active? Explain.



- e) Give the structure of biotin and explain the role of coenzyme A and cysteine in the biosynthesis.

Q.4 Answer **ANY THREE** of the following: [15]

- a) Androsterone shows following reactions. Write down the structures of the products.



- b) Write down the structures of different members of the prostaglandin depending upon the functionality in the five membered ring system i.e., prostaglandins A to F.
- c) In aqueous solution aldosterone was an equilibrium mixture of three structural isomers. Write down the structures of all the three isomers of aldosterone with mechanism.
- d) Write down steps involved in the following conversions:
i) Acetate CoA \rightarrow Mevalonic acid
ii) Mevalonic Acid \rightarrow Δ^3 IPP and DMAPP
- e) Discuss microbial production of Vitamin B₁.

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