MANIPAL
UNIVERSITY

Reg No										

DEPARTMENT OF SCIENCES
IV SEMESTER M.Sc (CHEMISTRY) END SEMESTER EXAMINATIONS, Apr 2017

SUBJECT: CHEMISTRY OF NATURAL PRODUCTS [CHM 702]

REVISED CREDIT SYSTEM

Time: 3 Hours Date: 20-04-2017 MAX. MARKS: 50

Instructions to Candidates:

Answer **ANY FIVE FULL** questions.
Write diagrams or equations wherever necessary

1A Write the structure of β-carotene. How is the symmetrical structure of β-carotene confirmed?

B Discuss the classification of tannins. Write a note on Kuhn-Roth oxidation

C What are the tests used to detect the different types of carbonyl group in terpenoids? Explain with example. **(3+3+4)**

2A Write the reaction sequence which establishes the presence of a phytyl group in chlorophyll-*a*.

B How do you effect the following conversions?

i) 

ii) Chlorophyll-a ⟶ Chlorine-e

C What are anthocyanidins? Explain in detail the structural elucidation of Pelargonidin chloride. **(3+3+4)**

3A What information can be obtained by the reaction of terpenoids with NOCl? Explain with an example.

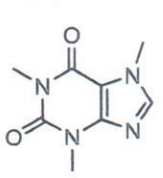
B How do you ascertain the presence of methyl ketone group in the terpenoid? How to prove that α-pinene contains one double bond in the ring?

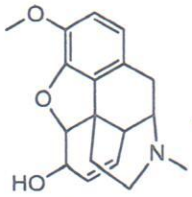
C Give the total synthesis of α-pinene from *cis*-norpinic acid. **(3+3+4)**

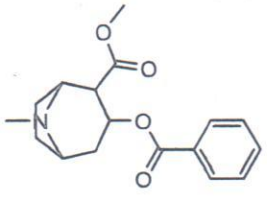
4A Comment on the structure of an alkaloid from the following data: (i) Exhibits IR peak at 3300 cm^{-1}. (ii) Consumes two equivalent of acetyl chloride. (iii) Form salt with 2 equivalents of HCl. (iv) Consumes 1 equivalent of oxidizing agent to give ketone. (v) 1,2-dibromide derivative is obtained when treated with bromine water. (vi) Gives characteristic colour with $FeCl_3$.

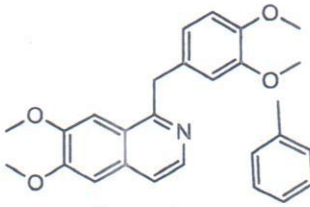
B Propose the reaction scheme for the conversion of ester to amide, amine, and quaternary ammonium salt.

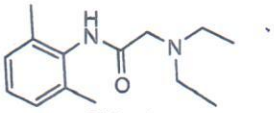
C Propose the chemical tests to differentiate the following alkaloids:
(i) Caffeine and Papaverine (ii) Papaverine and Codeine
(iii) Codeine and Cocaine (iv) Cocaine and Lidocaine **(3+3+4)**


Caffeine

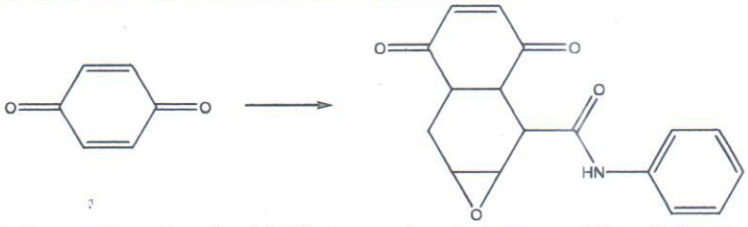

Codeine


Cocaine

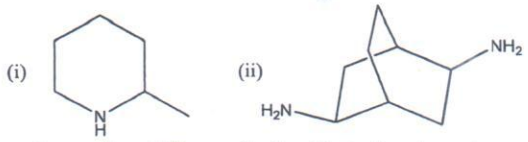

Papaverine


Lidocaine

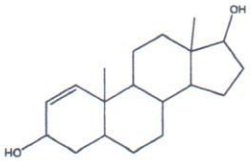
5A Propose the synthetic route for the following conversion. Note that one of the intermediate molecule gives effervescence with sodium bicarbonate.

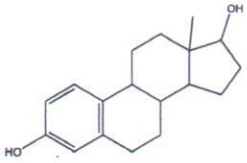


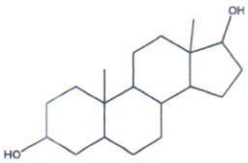
B Write the chemical reaction for the Hoffmann degradation of the following molecules.



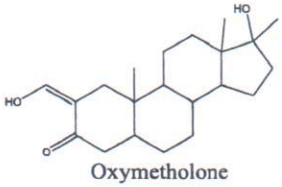
C Propose the chemical reactions to differentiate (i) 1-Androstenediol from Estradiol, (ii) 1-Androstenediol from 3β-Androstanediol and (iii) Estradiol from 3β-Androstanediol. **(3+3+4)**

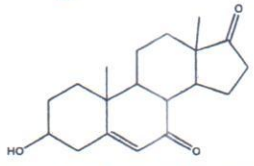

1-Androstenediol


Estradiol


3ß-Androstanediol

6A By taking suitable example, explain Barbier-Wieland degradation reaction.
B How do you differentiate (i) Vitamin K1 and K2 (ii) vitamin Aα and Aβ?
C Propose any four chemical reactions of the following molecules. **(3+3+4)**


Oxymetholone


Ketodehydroepiandrosterone

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