THE OPEN UNIVERSITY OF SRI LANKA

B Sc Degree Progamme/ Stand Alone course-2011/2012

Level 5-Continuous Assessment Test II (No Book Test)

CHU 3130/CHE 5130 – INTRODUCTION TO NATURAL PRODUCTS CHEMISTRY

Time : 1 1/2 Hours

Date : Monday 10th October 2011 **Time : 4.00 pm – 5.30 pm**

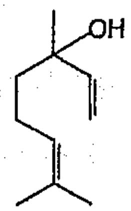
ANSWER ALL QUESTIONS IN THE SPACE PROVIDED.

Registration Number

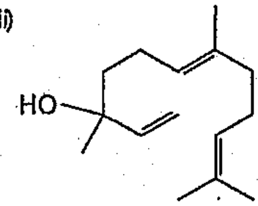
Question No.	Marks
1	
2	
3	
4	
5	
Total	

(1) (a) Show the isoprene units in each of the following terpenoids using …….lines.

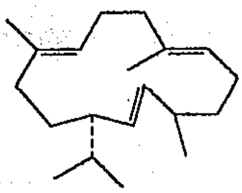
(i)



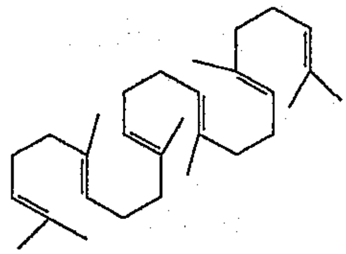
(ii)



(iii)

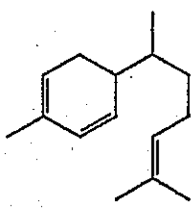


(iv)



(20 marks)

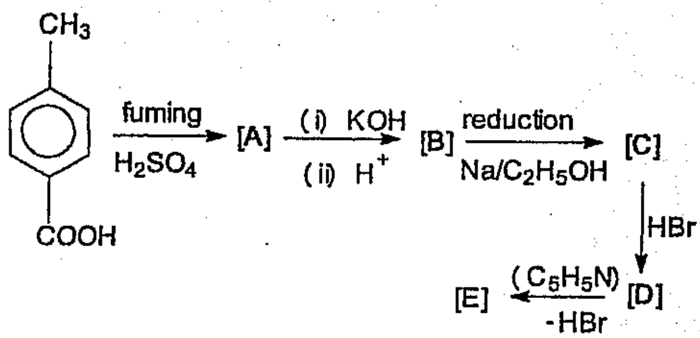
(2) What products would you expect to obtain if zingiberene was subjected to ozonolysis? Using Woodward-Fieser rules, calculate the expected λ_{max} for zingiberene. Woodward-Fieser rules of diene: Basic value for λ_{max} for unsubstituted conjugated acyclic or hetero annular diene = 214 nm, Basic value for homo annular diene = 253 nm, Increments: extended conjugation for each extra C=C = +30 nm, each exocyclic double bond = +5 nm, and each substituent on vinyl carbon = +5 nm.



Zingiberene

(20 marks)

(3) Complete the following reaction sequence by identifying the compounds **A-E.**



(20 marks)

A

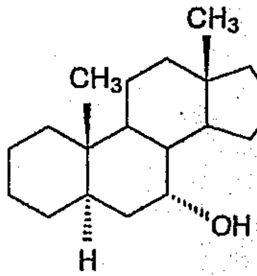
B

C

D

E

(4). (a) Explain why 5α-androstan-7α-ol is oxidized to the ketone by CrO_3-aqueous acetic acid hundred times faster than 5α-androstan-7β-ol.

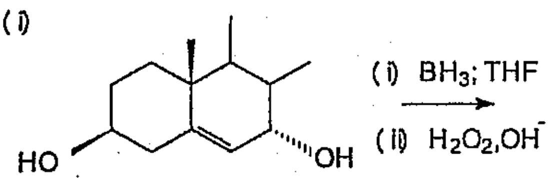


5α-androstan-7α-ol

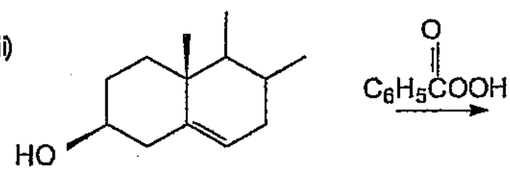
(10 marks)

(b) Give the structures of the products (with their stereochemistry) of the following reactions.

(i)

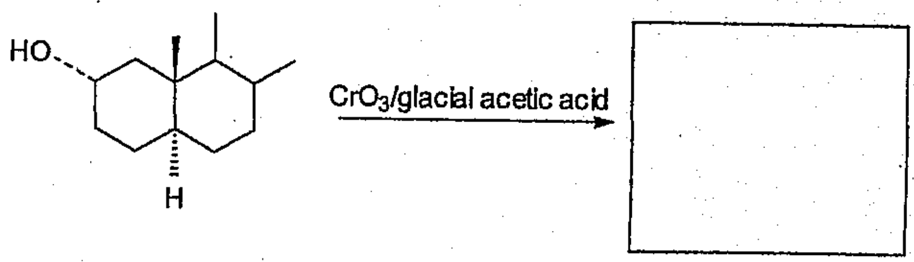


(ii)



(10 marks)

(5) (a)Draw the structure of the product of the following reaction.



(10 marks)

(b) What are the aglycones of cardiac glycocides are called? What are their structural differences.

(10 marks)

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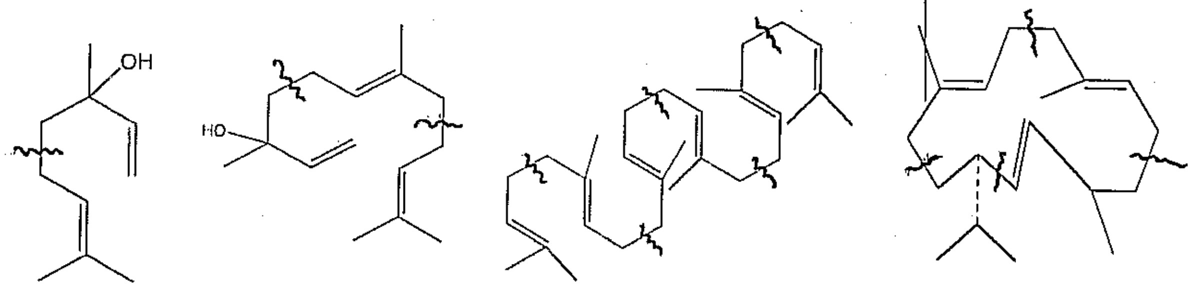
BSc Degree Programme -2011-2012

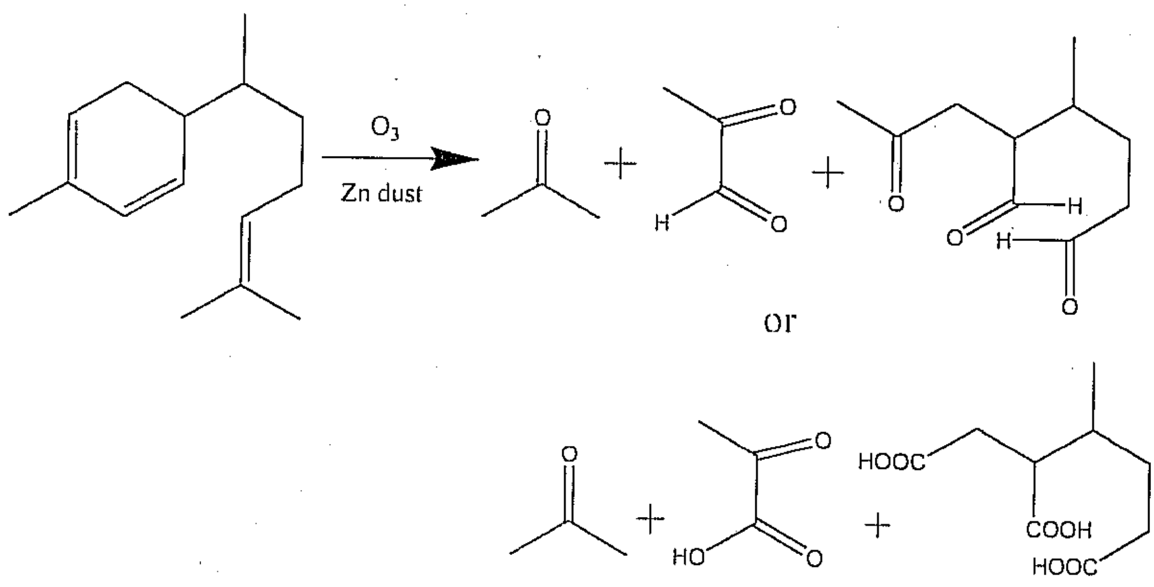
Level 5-

Answer guide for NBT II

1.

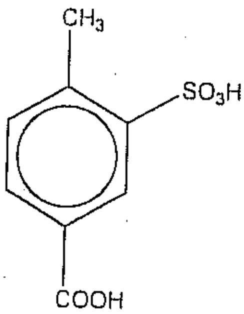


2.

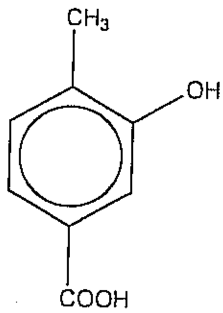


Basic value	253 nm
Vinyl substituent	15 nm
λ max	268 nm

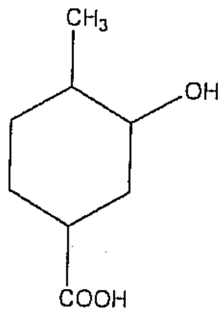
3.



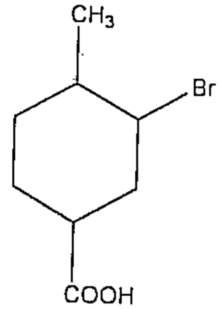
A



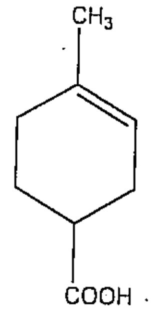
B



C

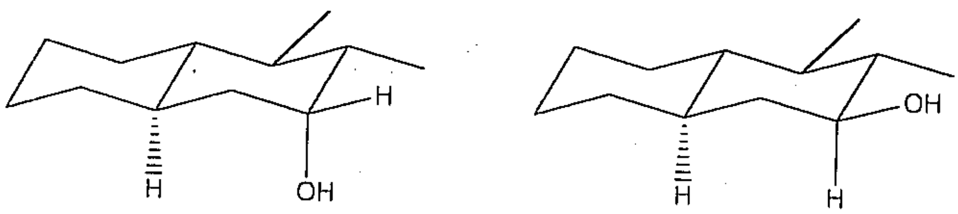


D



E

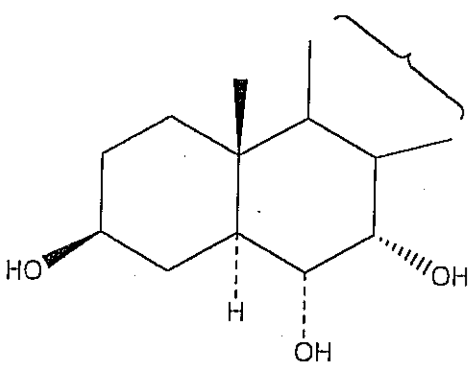
4. (a)



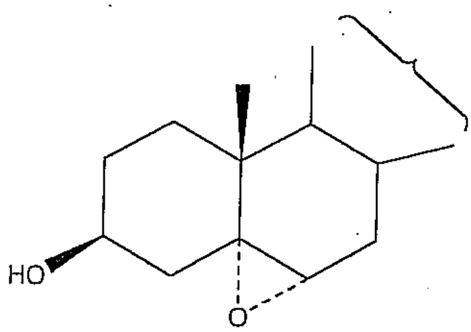
Secondary axial OH group are more rapidly oxidized by CrO3 acid than secondary equatorial OH group.more sericall hindered the alcohol,the faster is the oxidation.

When the OH group is axial 1,3 diaxial interactions are greater than where the OH is at equatorial. Therefore is relieved more in axial oh than isomer , then oxidize to a keton.

(b)

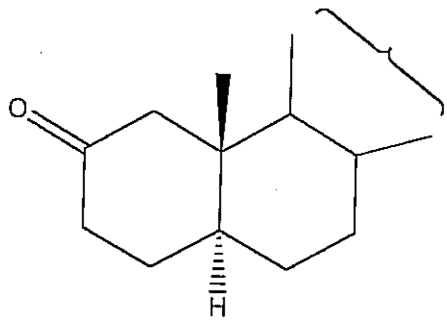


(i)



(ii)

5.



(b) Aglycones of cardiac glycosides are of two types.

i. Cardenolides
ii. Bufadienolides

Cardenolides – have an α,β – unwanted five membered lactone ring as a side chain at C-17.

Bufadienolides – have a six membered lactone ring with two conjugated double bonds as a side chain at C-17.