



THE OPEN UNIVERSITY OF SRI LANKA

B.Sc Degree Programme/Stand Alone Course – 2006/2007

Level 5 – Continuous Assessment Test I (No Book Test)

CHU 3131/CHE 5131- Chemistry of Amino Acids Sugars and Related Compounds

Time: 1 ½ Hours

Date: Monday 8th January 2007

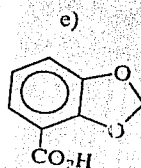
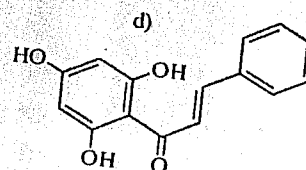
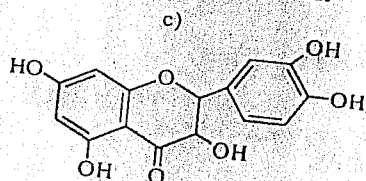
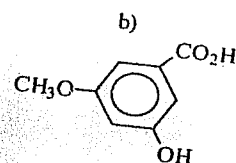
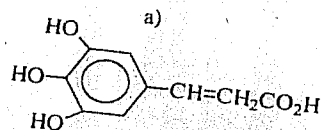
Time : 3.30 p.m. – 5.00 p.m.

ANSWER ALL QUESTIONS IN THE SPACE PROVIDED.

Registration Number

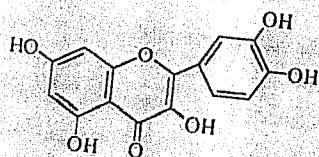
Question No.	Marks
1	
2	
3	
4	
5	
Total	

1. Phenolic compounds are derived from different biosynthetic pathways. Name the possible biosynthetic pathway for each of the following types.



2. The flavonoid - quercetin (A) act as a good antioxidant.

(20 marks)



(A)

- (i) Draw the structural forms responsible for the two characteristic absorption bands in UV-visible spectra of quercetin(A).

Structure for Band I

Structure for Band II

- (ii) What change would you expect in the UV-Vis. spectra of (A) when $AlCl_3$ is added? Explain briefly.

(iii) What is the product obtained when quercetin (A) is treated with Mg/HCl?

(17 marks)

3. Tannins are polyphenols which occur naturally in plants.

(i) Name the two main groups of tannins

Indicate the basic subunits which they are made up of in each case.

Type	Subunits
a)	
b)	

(ii) What is the effect of tannins on protein?

(iii) The classes of compounds given below have a variety of biological/industrial applications.

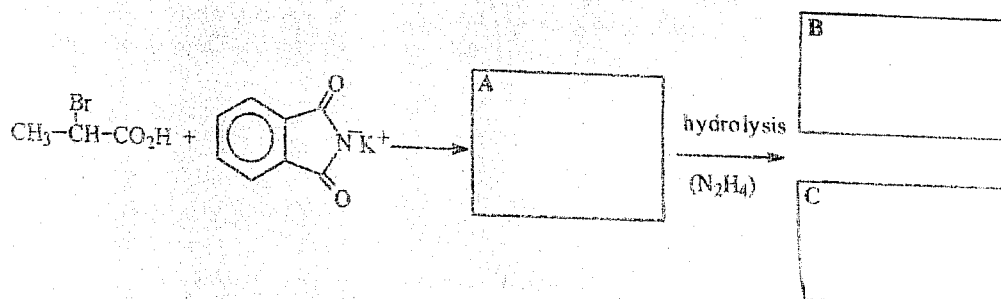
tannins, flavonoids, lignins, lignans, chalcones, aurones, coumarins

Give the correct type of compound responsible for the following.

- An useful binder for clay and cement.
- Promotes dilation (widening) of blood vessels.
- A common intermediate in the biosynthesis of all types of flavonoids.
.....
- A competitive inhibitor of Vitamin K.

4. Give the structures A-G

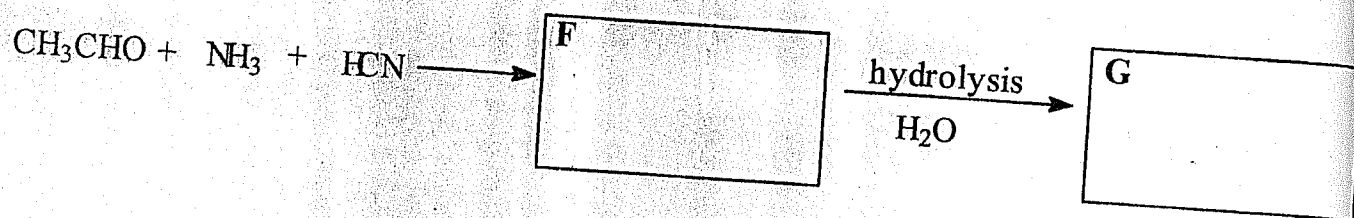
(21 marks)



(ii)



(iii)



(21 marks)

5. (i) List three chemical manipulations involved in sequencing to analyze the structure of a protein.

- a)
- b)
- c)

(ii) Indicate whether these statements are true (T) or false (F). Circle the correct letter.

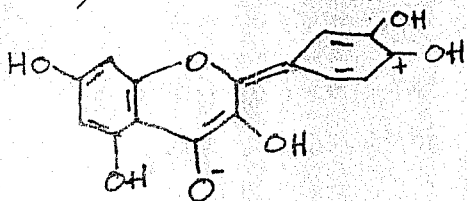
- a) All naturally occurring amino acids have D configuration. T / F
- b) The only way that nitrogen can enter into a biomolecule is transamination. T / F
- c) Formation of the methyl ester to protect the carboxyl group of an amino acid is not recommended. T / F
- d) Amino acids exist as zwitterion in aqueous solutions. T / F
- e) Nucleoside is a monomeric unit containing a pentose sugar, a heterocyclic base and phosphate. T / F
- f) Purine ring system contains four N atoms while pyrimidine has a 3 N atom ring system. T / F

(21 marks)

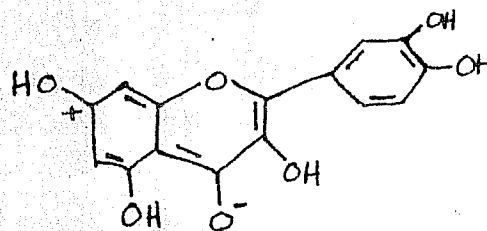
Answer guide for Assessment Test 1

- 1.
- a) Shikimic acid pathway
 - b) Polyketide pathway
 - c) combined (Shikimic acid & polyketide) pathway.
 - d) Polyketide pathway
 - e) Shikimic acid pathway.

2. i) Structure for Band I

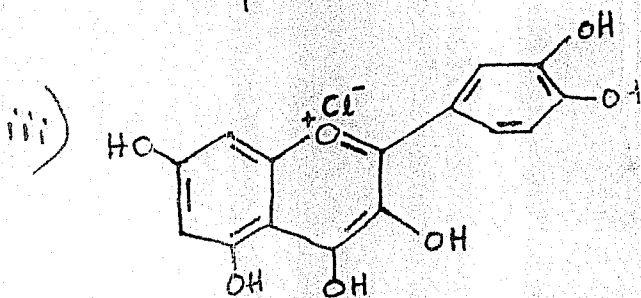


Structure for Band II



ii) Bands get shifted to longer wave lengths (Bathochromic shift).

c=O group at 4th position complexes with OH group at 3rd position which is more stable than at 5th position.



cyanidin chloride/anthocyanidin.

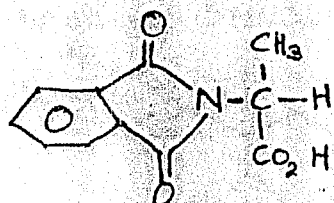


3. i) a) Hydrolysable tannins - Sub units Carbohydrate & phenol acid
 b) Condensed tannins - Flavonoids

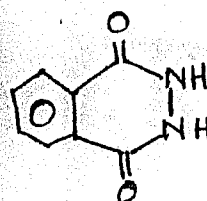
ii) Tannins complex and precipitate proteins.

- iii) a) Lignins c) Chalcones
 b) Flavonoids d) Coumarins

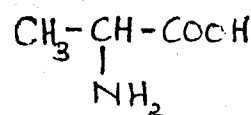
4. i)



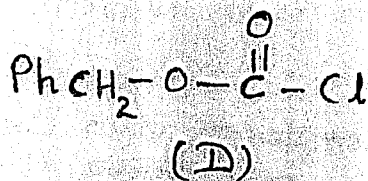
(A)



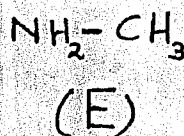
(B)



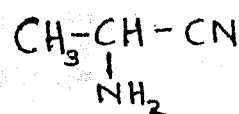
(C)



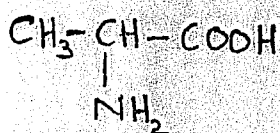
(D)



(E)



(F)



(G)

5. i) a) Total hydrolysis.
 b) End group analysis.
 c) Partial hydrolysis.

ii) a) F

d) T

b) F

e) F

c) T

f) T