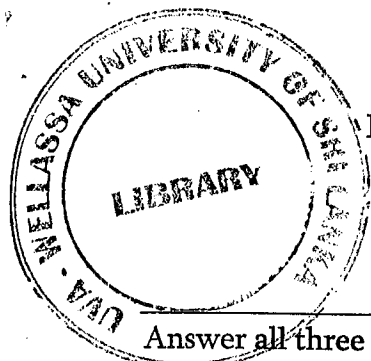
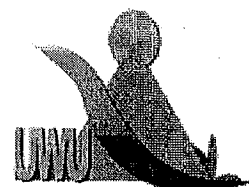




Uva Wellassa University of Sri Lanka
End Semester Examination – February / March 2012
SCT 325-2 Natural Products Chemistry



Time: Two (02) hours

Answer all three questions.

Write your answer for Question 1 in the appropriate space in the question paper.

1. Consider the natural products *A* to *L* given on page 4
 - a. i Assign each of the natural products *A* to *L*, to the appropriate class choosing from the following: monoterpene, diterpene, tetraterpene, sesterterpene, sesquiterpene, coumarin, flavone, flavonol, catechin, anthocyanin, flavanone, steroid, fatty acid, polyketide, fat/oil, alkaloid and simple phenylpropanoid.
 - ii. Name the pathway(s) in biosynthesis of each of the natural products *A* to *L* as Mevalonate, Acetate, Shikimate, Malonate or none of them.

Compound	Class	Biosynthetic Pathway(s)
<i>A</i>		
<i>B</i>		
<i>C</i>		
<i>D</i>		
<i>E</i>		
<i>F</i>		
<i>G</i>		
<i>H</i>		
<i>I</i>		
<i>J</i>		
<i>K</i>		
<i>L</i>		

24 marks

- b. i. Identify the biosynthetic building blocks of natural products *A*, *C*, *F*, *H* and *J* as C_2 , C_5 or C_6C_3 .

A- _____
C- _____
F- _____
H- _____
J- _____

5 marks

- ii. Write the structure and name of each of the biosynthetic building blocks C_2 , C_5 and C_6C_3 .

Biosynthetic building block	Structure and name of biosynthetic precursor(s)
C_2	
C_5	
C_6C_3	

8 marks

- c. Five compounds described below are included among the natural products *A* to *L* (see page 4). Identify each and write the relevant letter (*A*, *B*, *C*, ..., or *L*) in front of the statement.

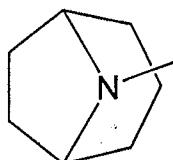
- i. Nicotine, a compound that is 0.6–3.0% of the dry weight of tobacco.
 ii. Cholesterol, the principal sterol synthesized by animals.
 iii. Lycopene, a bright pigmented compound found in tomatoes.
 iii. Taxol, anticancer drug originally obtained from the bark of the Pacific yew tree.
 v. Eugenol, a major constituent of clove oil.

5 marks

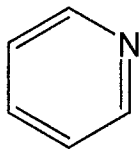
2. Answer two parts only

- a. i. Draw the basic skeletal structure of steroids and number the C atoms using numbers 1-25 and the rings as A-D according to the standard nomenclature.
ii. Draw the basic skeletal structure of flavonoids and number the atoms using 1-9 and 1'-6' and rings as A-C according to the standard nomenclature.
iii. Identify the following ring structures X-Z as pyridine, indole and tropane.

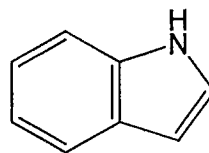
X



Y



Z



- iv. What are saponins? Explain how saponins act as forming agents, relating to their structure.

15 marks

- b. Write a short account on "Antioxidant natural products".

15 marks

- c. Write a short account on "Natural products involved in plant-animal interactions".

15 marks

3. a. Name four solvent extraction methods for isolating natural products.

4 marks

- b. Name three column chromatographic methods that can be used to separate crude extracts of natural products.

3 marks

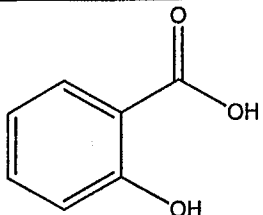
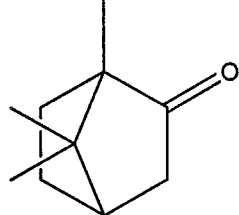
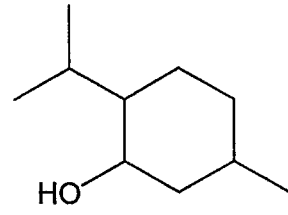
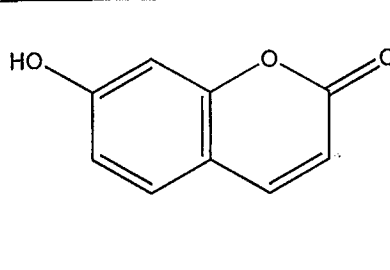
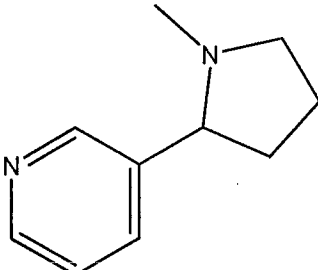
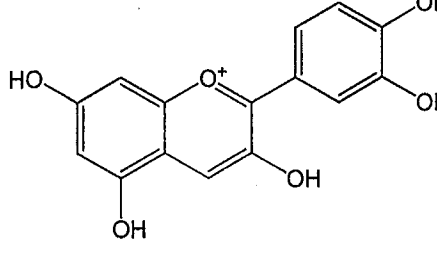
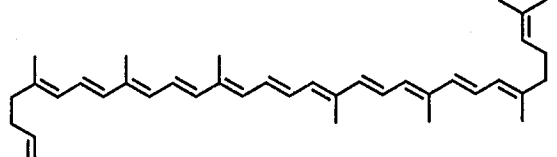
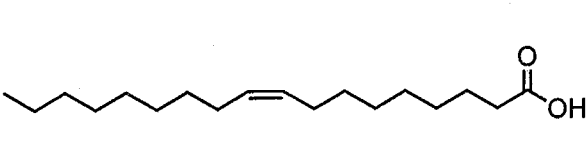
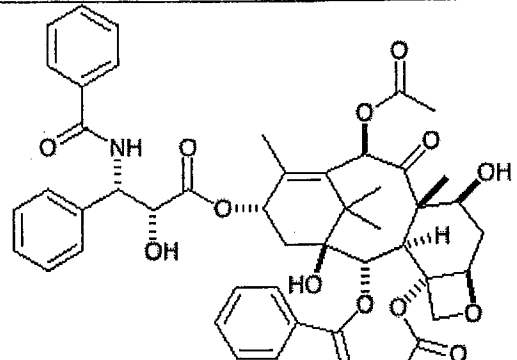
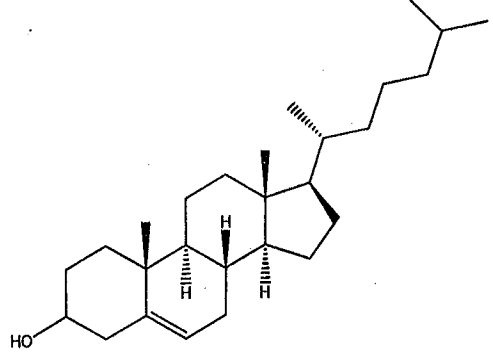
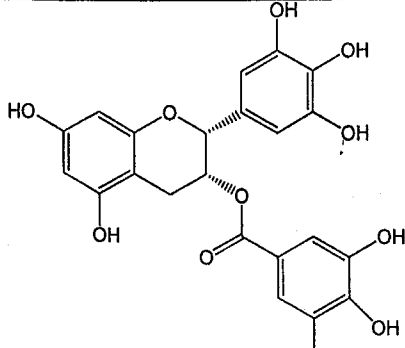
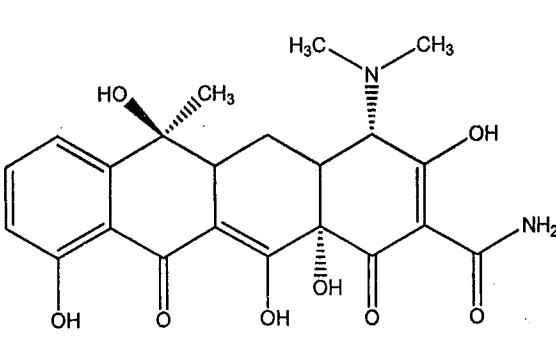
- c. Explain what is mean by bio-assay guided isolation of an active natural product?

5 marks

- d. Assume that in a project, you have been assigned to isolate insecticidal natural products from a particular plant, with the aim of developing a product in agricultural pest controlling. Using a flow chart, show all the steps that you should follow during your project.

15 marks



		
A	B	C
		
D	E	F
		
G	H	
		
I	J	
		
K	L	