



UNIVERSITY OF JAFFNA, SRI LANKA
BACHELOR OF PHARMACY
THIRD YEAR SECOND SEMESTER EXAMINATION – JANUARY 2013

Chemistry of Natural Products II, PHACN 3203

Paper II

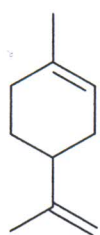
ANSWER ALL SIX QUESTIONS.

Date: 21.02.2013.

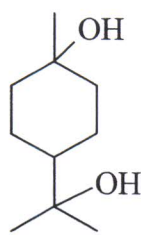
Time: 02 Hours

1.

- 1.1 What do you understand by the terms “terpenes” and “terpenoids”? (20 Marks)
- 1.2 Draw the structure for the following compounds in terpenoid chemistry.
- 1.2.1 Geraniol (07 Marks)
- 1.2.2 α -terpineol (07 Marks)
- 1.2.3 Carvone (07 Marks)
- 1.2.4 Camphor (07 Marks)
- 1.3 How do you synthesise terpinhydrate (or *cis*-1,8-terpin) from limonene? Give essential reagents and experimental conditions. (40 Marks)
- 1.4 Explain the uses of terpinhydrate (or *cis*-1,8-terpin) for treatment. (12 Marks)



Limonene



terpinhydrate or
cis-1,8 terpin

2.

2.1 Draw the chemical structure of the following compounds.

2.1.1 Penicillin II or Penicillin G (10 Marks)

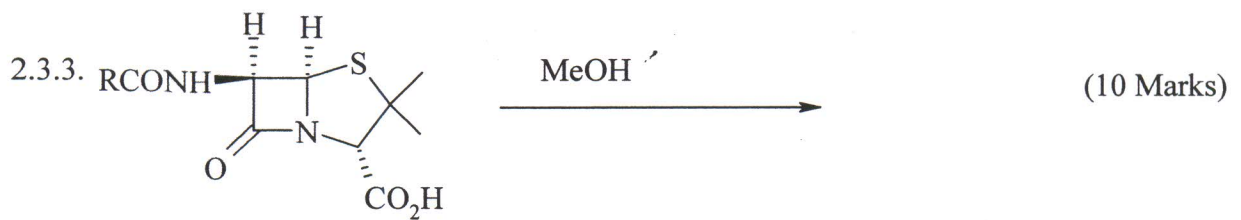
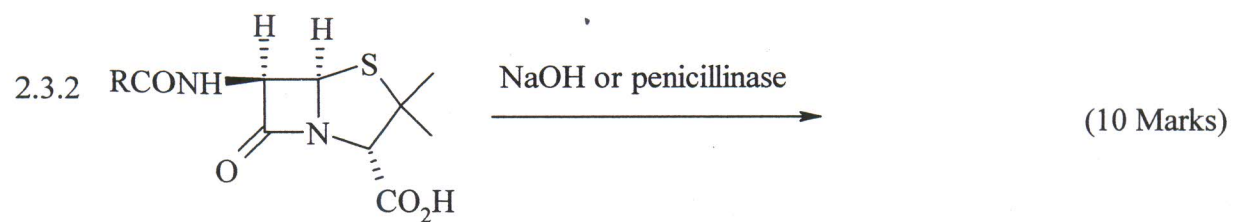
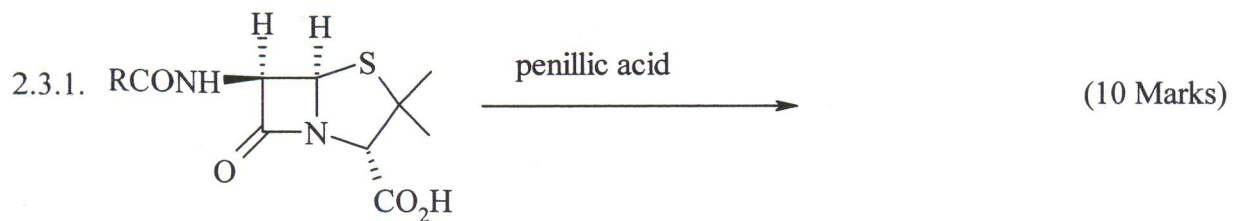
2.1.2 Penicillin V (10 Marks)

2.1.3 (D)-Penicillamin (10 Marks)

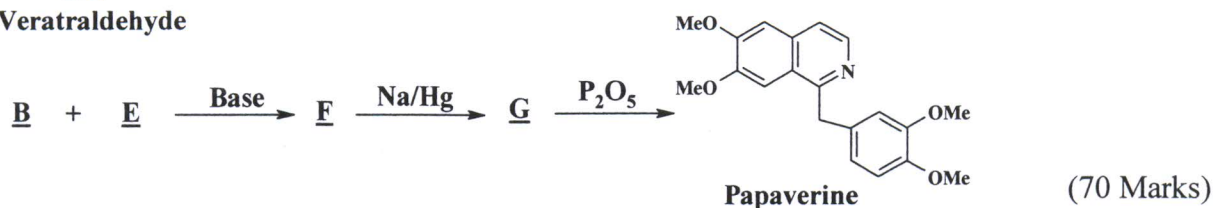
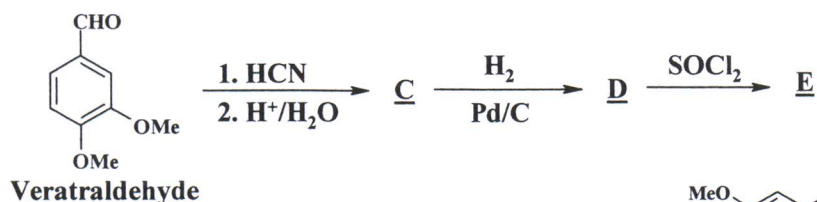
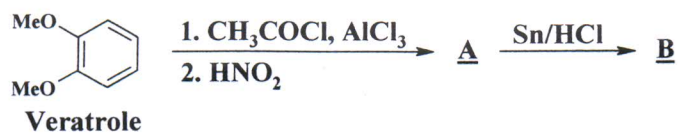
2.1.4 Chloramphenicol (10 Marks)

2.2 Discuss the structure activity relationship of penicillins. (30 Marks)

2.3 Give the structure of the product that would be formed in each of the following reactions.



- 3.1 Papaverine, an opium constituent, has clinical use as antispasmodic agent. It could be synthesized from veratrole and veratraldehyde by the following sequence of reactions. Deduce the structures of the synthetic intermediates **A**, **B**, **C**, **D**, **E**, **F** and **G**.

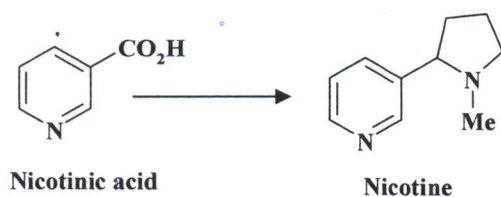


- 3.2 Suggest a plausible mechanism for the formation of **F** from **B** and **E**. (30 Marks)

4.

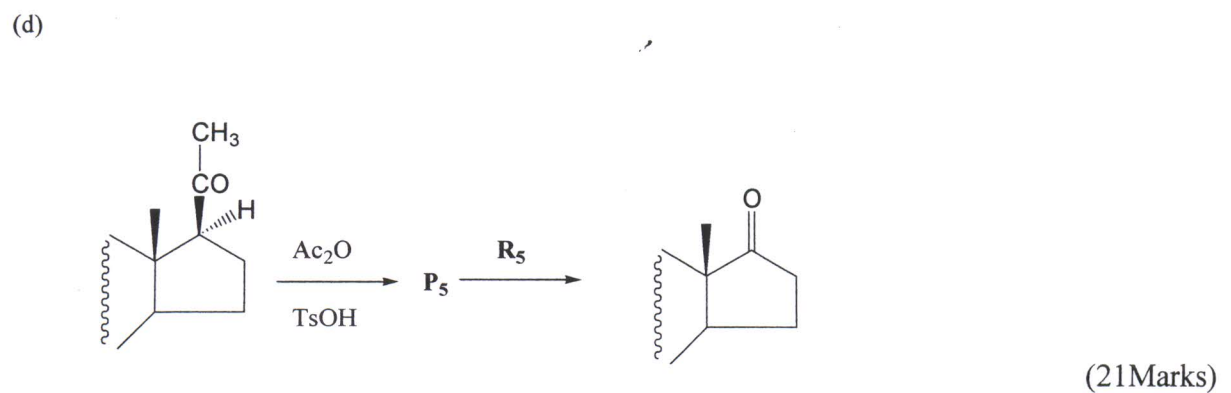
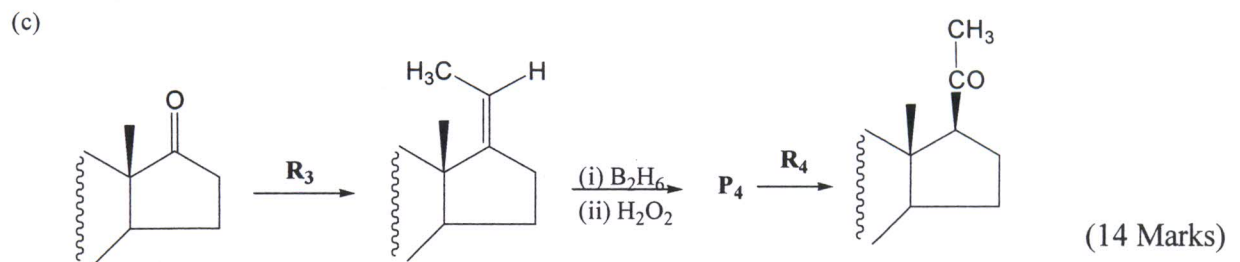
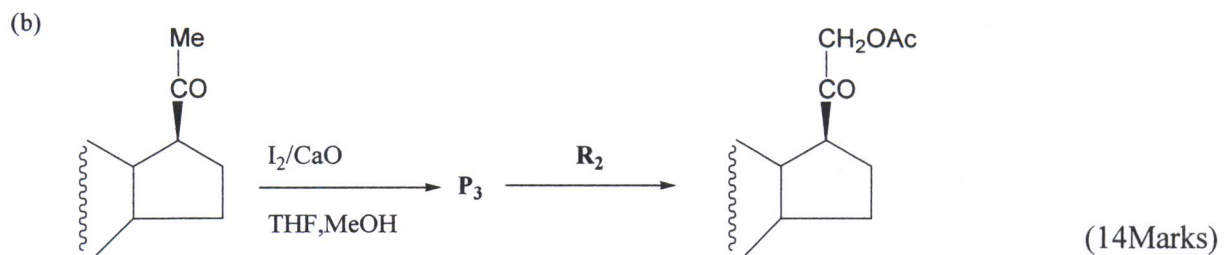
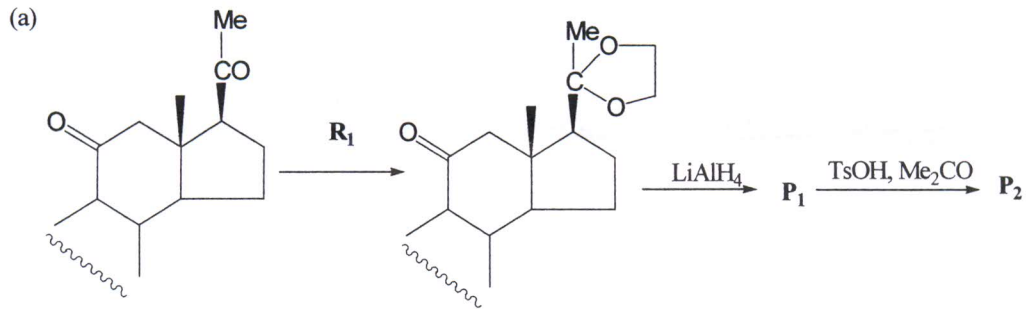
- 4.1 Briefly explain the method of isolation of nicotine from tobacco leaves. (40 Marks)

- 4.2 How would you convert nicotinic acid to nicotine in the laboratory? (60 Marks)



5.

5.1 The following reaction schemes consist of reactions of steroids. Give the missing reagents and products in this reaction schemes.

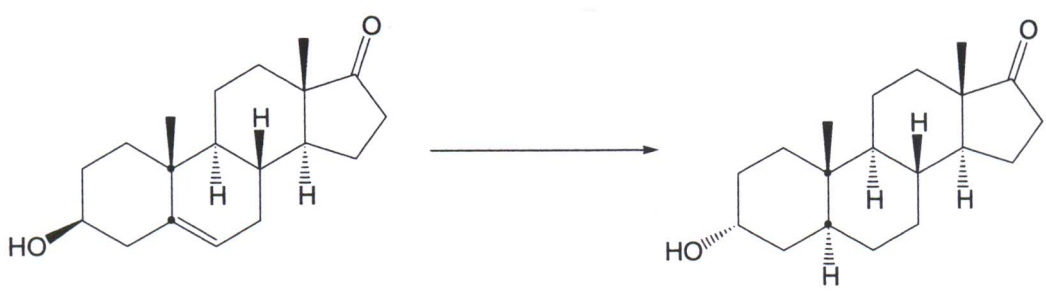


5.2 Briefly discuss the tests (coloured reactions) to identify the sterols. (30 Marks)

6. Sex hormones are classified under steroids.

6.1 Briefly discuss the sex hormones present in human. (30 Marks)

6.2 Indicate how the following transformation may be effected. Give the essential reagents and experimental conditions (more than one step may be involved) (40 Marks)



6.3 Write short notes on the following:

6.3.1 Non steroidal hormones (15 Marks)

6.3.2 Oral contraceptives. (15 Marks)