UNIVERSITY OF JAFFNA, SRI LANKA

BACHELOR OF PHARMACY

FOURTHYEAR FIRST SEMESTER EXAMINATION – NOVEMBER 2014

PHANP 4104 – NATURAL PRODUCT CHEMISTRY

PAPER II

Date: 27.11.2014 **Time: 2 Hours**

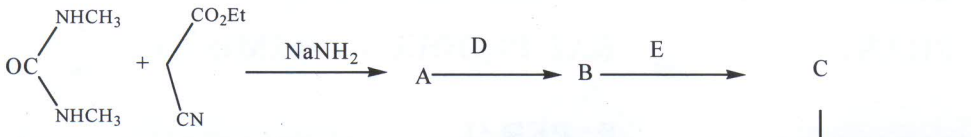
ANSWER THE ALL QUESTIONS

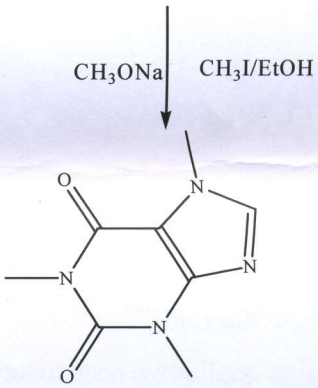
1. 1.1 What are "Steroids"? (10 Marks)
   1.2 Give five qualitative tests to analyse sterols. (20 Marks)
   1.3 Briefly discuss the physiological activity of following steroids:
   1.3.1 Androgens (10 Marks)
   1.3.2 Oestrogens (10 Marks)
   1.3.3 Progesterone (10 Marks)
   1.4 Indicate how progesterone could be synthesized from diogenin. (40 Marks)

2. 2.1 Define "Antibiotic". (10 Marks)
   2.2 Draw the chemical structure of Penicillin and state the structure activity relationship of Penicillin. (20 Marks)
   2.3 Discuss the mechanism of action of Penicillin. (30 Marks)
   2.4 Indicate by means of equations, how the Chlortetracycline could be biosynthesized from 6-Methylpretetramide. (40 Marks)

3. 3.1 Briefly explain the isolation method of caffeine from tea leaves. (20 Marks)
   3.2 Briefly describe the therapeutic uses of Caffeine in human. (30 Marks)

3.3 Deduce the structures of the synthetic intermediates [A, B and C] and reagents [D and E] and indicate the commercial name of it synthesis method. (50 Marks)





Caffeine

4. 4.1 Write short notes on Griseofulvin and Doxorubicin. (50 Marks)

4.2 Show how the following conversions may be effected. Give essential experimental conditions for following conversions.

4.2.1 p-Nitroacetophenone ⟶ Chloramphenicol (30 Marks)

4.2.2 Benzaldehyde ⟶ N-[1,2-Dihydroxy-2-(4-nitro-phenyl)-ethyl]-acetamide (20 Marks)

5. 5.1 Write an account on Cardiac glycosides. (15 Marks)

5.2 Indicate how the following transformations may be effected and give essential reagents and experimental conditions.

5.2.1 Anethole ⟶ trans-Diethylstillbesterol (15 Marks)

5.2.2 1-(4-Hydroxy-phenyl)-propan-1-one ⟶ Dienestrol (15 Marks)

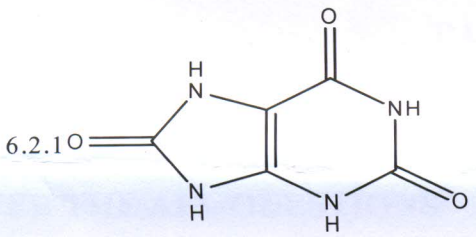
5.2.3 Pregnenolone ⟶ Deoxycorticosterone (20 Marks)

5.2.4 Methyl ether estrone ⟶ Estriol (25 Marks)

6. 6.1 Draw the chemical structures of Xanthine derivatives and show the inter relationship between them. (50 Marks)

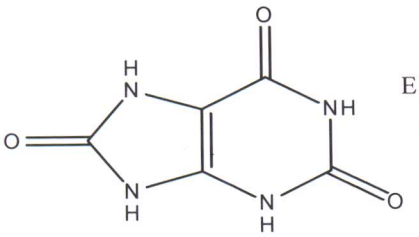
6.2 Give the structure of the product that would be formed in each of the following reactions. (50 Marks)

6.2.1



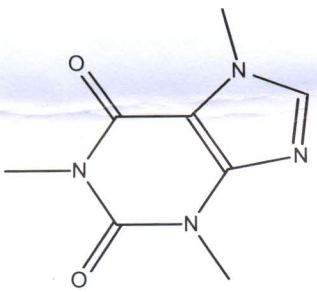
HNO_3, H_2O →

6.2.2



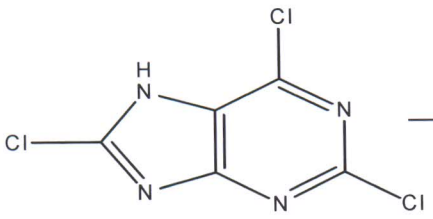
Electrocyclic reduction →

6.2.3



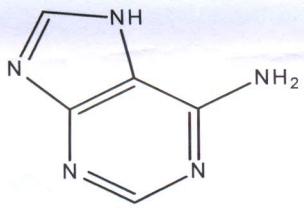
$KClO_3$ →

6.2.4



Aq KOH, 100^0C →

6.2.5



$NaNO_2$ in Aquceous HBF_4 →