UNIVERSITY OF JAFFNA, SRI LANKA
BACHELOR OF PHARMACY
FOURTH YEAR FIRST SEMESTER EXAMINATION- 2021
PHANP 4124 NATURAL PRODUCT CHEMISTRY

Date: 17. 02. 2021 **Time: 02 Hours**

Answer All SIX Questions.

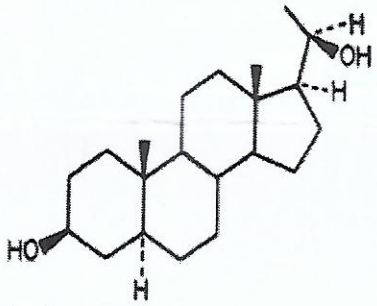
1. **1.1** Draw the structures of caffeine, theophylline and theobromine **(25 marks)**

   1.2 Compare the biological effects of caffeine, theophylline and theobromine. **(30 marks)**

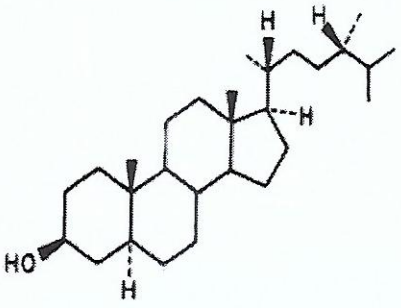
   1.3 Discuss the steps involved in the extraction and isolation of caffeine from tea. **(45 marks)**

2. **2.1** Write the names of the following steroid compounds.

   2.1.1 **(10 marks)**



   2.1.2 **(10 marks)**



   2.2 **2.2.1** List the steps involved in the biosynthesis of cholesterol. **(20 marks)**

   2.2.2 Indicate the name and reaction path of the rate limiting step in the above mentioned steps. **(30 marks)**

   2.2.3 Name one class of drugs which inhibits the rate limiting step. **(10 marks)**

   2.3 Briefly describe the biological significance of cholesterol. **(20 marks)**

3.1 List the structural features of the followings.

3.1.1 Glucocorticoids. **(20 marks)**

3.1.2 Mineralocorticoids. **(20 marks)**

3.2 Explain the Structure Activity Relationship (SAR) of corticosteroid hormones. **(60 marks)**

4.1 Draw the structures of the following oestrogens.

4.1.1 Estradiol **(10 marks)**

4.1.2 Estrone **(10 marks)**

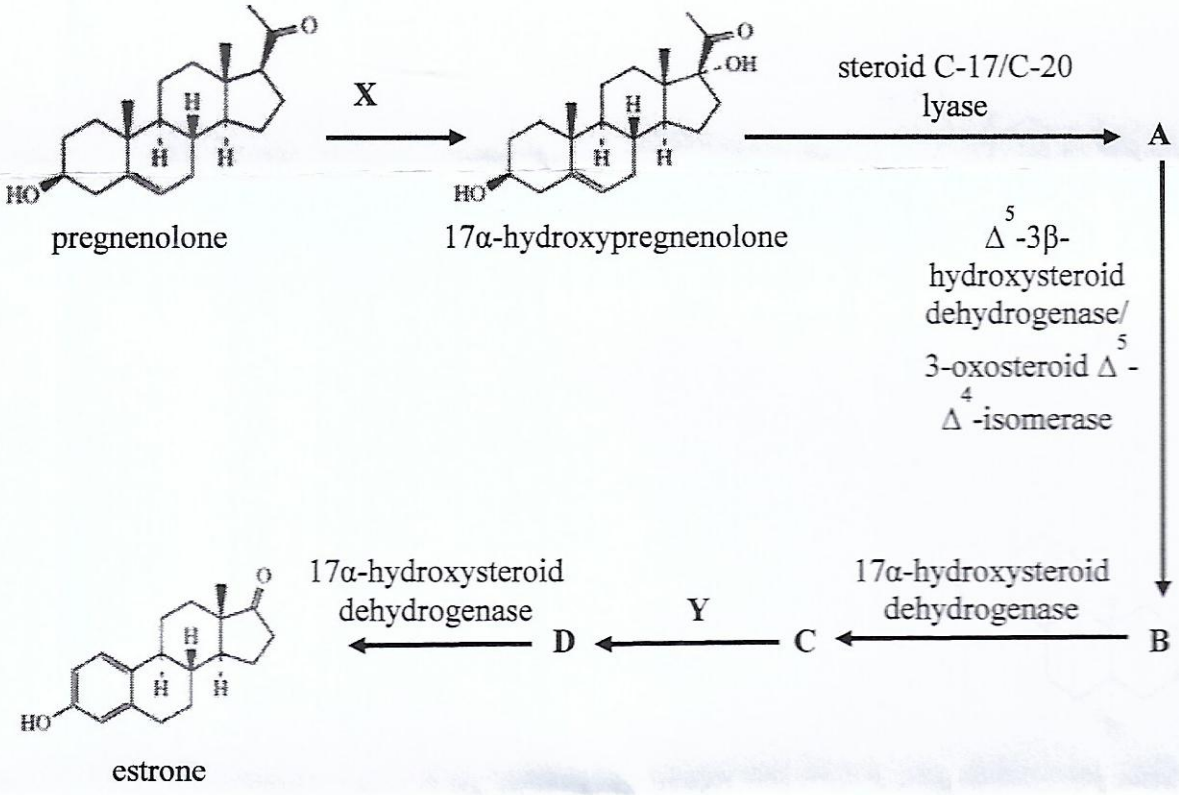
4.1.3 Estriol **(10 marks)**

4.2 List the uses of oestrogens. **(20 marks)**

4.3 Pregnenolone acts as a precursor in the oestrogen biosynthesis.

4.3.1 Deduce the structures and write the names of intermediates A, B, C, D **(40 marks)**

4.3.2 Write the names of enzymes X, Y **(10 marks)**



5.1 Draw the structure of benzyl penicillin. **(15 marks)**

5.2 Name and draw the structures of the precursors involved in the benzyl penicillin biosynthesis. **(25 marks)**

5.3 Describe the degradation of benzyl penicillin at various pH. **(60 marks)**

6. **6.1** Draw the structure of streptomycin and indicate the main structural units. **(30 marks)**

6.2 Explain the Structure Activity Relationship (SAR) of streptomycin. **(50 marks)**

6.3 Draw the possible isomers of chloramphenicol. **(20 Marks)**