

UNIVERSITY OF ESWATINI



Final Examination

TITLE OF PAPER:

Natural Products Chemistry

COURSE NUMBER:

CHE 432

TIME ALLOWED:

Three Hours

INSTRUCTIONS:

Answer any four (4) questions of the six (6) questions and every question holds 25 marks.
NB: all questions are to be answered in a separate answer sheet.

Question 1

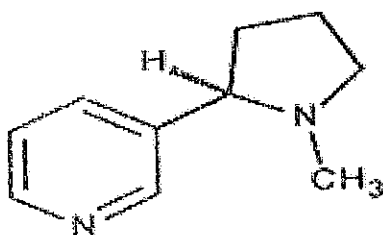
- Explain clearly the primary, secondary, tertiary and quaternary structures of proteins. (12)
- What are enzymes and what is their role in the body of higher animals? (6)
- Give examples of acidic and basic amino acids including their structure? (7)

Question 2

- What is the meaning of reducing sugars? What are Tollen's reagent and Fehling's solution and what are they used for? (10)
- What are carbohydrates? Give the functional and structural similarity and difference between the three carbohydrate polymers starch, glycogen and cellulose. (10)
- Explain Ruff degradation reaction? (5)

Question 3

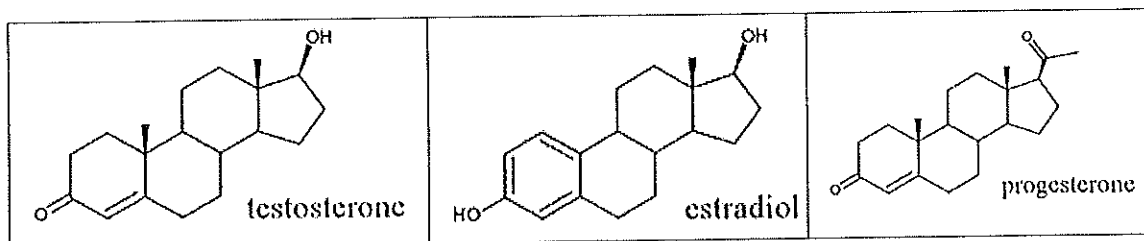
- The following reactions are used as qualitative tests of Alkaloids. Explain the reactions including their mechanism. (6)
 - Dragendorff's reagent
 - Mayer's reagent
- Show the biosynthetic route for the production of alkaloids, terpenoids and flavonoids taking into account the most basic chemicals (H_2O and CO_2). (10)
- Is the compound given here an alkaloid? Explain and justify your answer. (5)



- Mention the two commonly known malaria drugs which are alkaloids? (4)

Question 4

a) What are the active functional groups in the following hormones? (10)

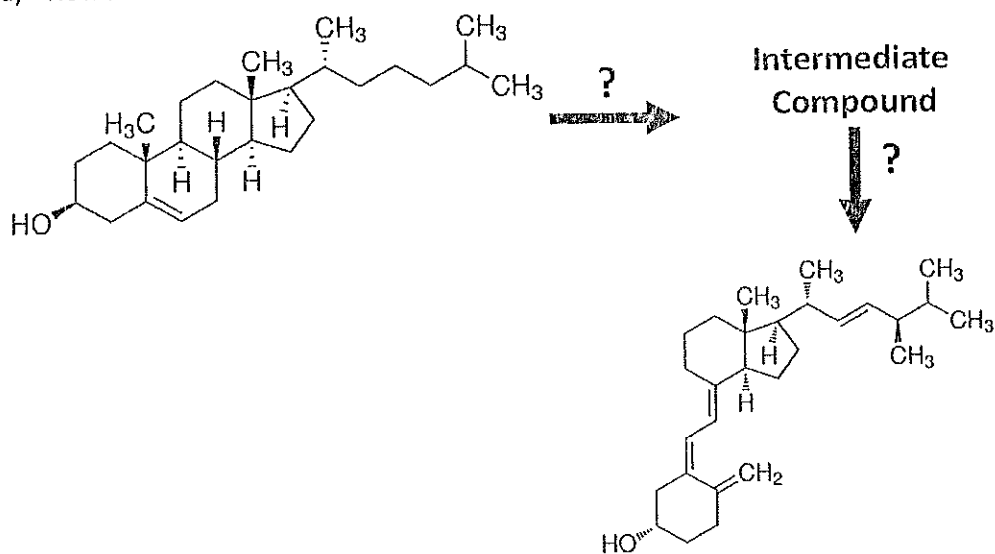


b) What are the roles of these hormones in determining sexual characteristics? (9)

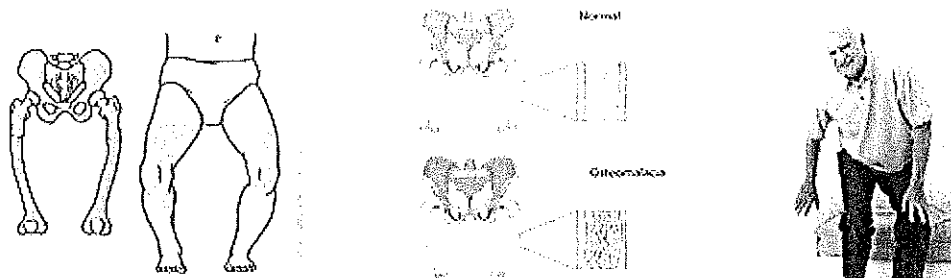
c) What are the types of hormones in human bodies and how they transported? (6)

Question 5

a) How is cholesterol transformed to calciferol? (6)



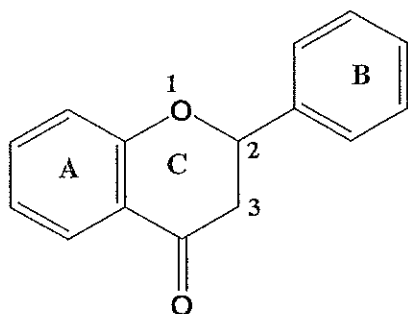
b) What can you observe from the following picture? (6)



c) Show that cholesterol is a Triterpen using the isoprene rule. (5)

Question (6)

The flavone indicated below has three important component parts rings A, B and C.



- Which of the three rings is more reactive? Give reasons for your choice? (6)
- How is the chemical properties modified when 2-3 double bonds are introduced? (6)
- Mention some common sources of flavonoids. (5)
- Why are flavanoids very useful in medicinal use? Explain and justify your answer. (8)