



KENYATTA UNIVERSITY

SUPPLEMENTARY/SPECIAL EXAMINATION 2021/2022

EXAMINATION FOR THE DEGREE OF BACHELOR OF PHARMACY LEVEL V

PPC 520: PHARMACEUTICAL CHEMISTRY VI

MARCH 2022

TIME: 2 HOURS

INSTRUCTIONS:

1. The paper consists of three sections; A, B and C.
2. Answer all questions.
3. Answer sections A, B and C in separate booklets.

SECTION A: PHARMACODYNAMIC AGENTS I

1. Compare acetaminophen and aspirin with regard to structure, metabolism and biological activities. (12 mks)
2. (a) Use the structure in figure 1 below to answer the questions below.

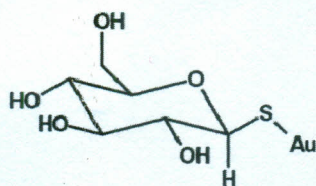


Fig. 1

- (i) Give the chemical class and name of the drug shown (2mks)
- (ii) Outline the mechanism of action and the clinical use of the drug. (3mks)

(b) Answer the following questions with regard to the drug shown in figure 2 below.

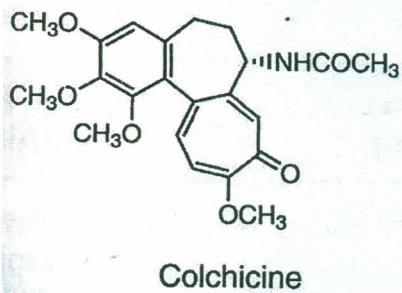
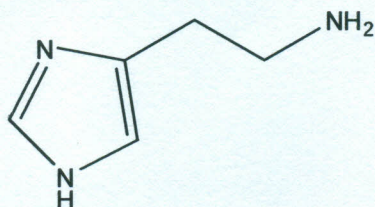


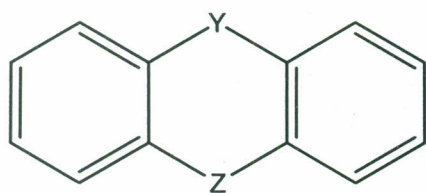
Fig. 2

- (i) Give the chemical class of the drug. (1mk)
- (ii) Explain its use in treatment of gout. (4mks)
3. (a) Outline the chemistry and MOA of a class of antidiabetic drugs whose biological activity is,
- (i) Insulin dependent (4mks)
- (ii) Insulin independent (3mks)
- (b) Compare the acid-base properties of aspirin and chlorpromide. (3mks)
4. Describe the chemistry of a class of pain management drugs that act through,
- (a) enhancing the excretion of an endogenous metabolite (3mks)
- (b) reduction of dilation of blood vessels (3mks)
- (c) inhibition of muscular activity (2mks)

SECTION B: PHARMACODYNAMIC AGENTS II



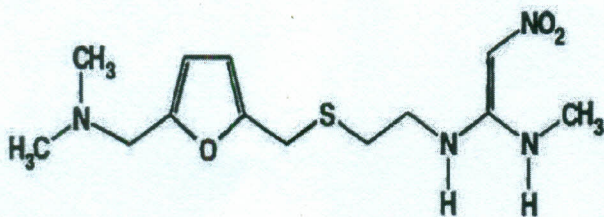
- 1) Using illustrations, explain the biosynthesis and metabolism of Histamine whose structure is shown above. (5 marks)
- 2) Describe the H4 antagonists. (5 marks)



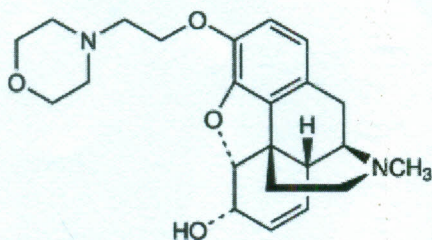
3)

Refer to the diagram above of Phenothiazines

- a) Name three structure and their respective substituents at Y and Z. (3 marks)
 - b) Explain the structural activity relationship of Phenothiazine antihistamines and compare them with those of phenothiazine antipsychotics. (6 marks)
- 4) a) Explain the biosynthesis of Vitamin D in the skin. (4 marks)
 - b) Explain its role and conditions associated with its deficiency and excessive amounts. (2marks)
- 5) a) Using chemical equations explain the synthesis of ranitidine whose structure is below. (6marks)



- b) Explain how the assay of ranitidine is performed. (2 marks)
6. Describe the roles of Zinc, folic acid and Zinc in the body. (3 marks)



7. Kindly refer to the diagram above.
 - a) Name it and state its mechanism of action. (3 marks)
 - b) Name its natural analogue and the advantage of the drug above over its natural analogue. (1 mark)

SECTION C: HORMONAL AGENTS I

1. Using a relevant drug structure in each case, describe **three** structural features responsible for estrogenic activity of a given drug molecule. Illustrate (5 marks)
2. Discuss the significance of the knowledge on chirality in the drug design of peptide hormones. (5 marks)
3. Describe the structural modifications carried out on gonadoliberein to reduce inactivation and enhance the half-life. (4 marks)
4. Describe three SARs of iodothyronines (6 marks)
5. With the aid of relevant drug examples, describe **three** SARs of the following.
 - a) Progestins (10 marks)
 - b) Glucocorticoids (10 marks)