

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE
OF BACHELOR OF SCIENCE

CHIN 431: INDUSTRIAL PHARMACEUTICAL CHEMISTRY

STREAMS: BSC

TIME: 2 HOURS

DAY/DATE: MONDAY 06/04/2020

11.30 A.M. – 1.30 P.M.

INSTRUCTIONS: ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- a) i) Define a drug (1 mark)
ii) Discuss briefly the three main ways in which drugs can be classified (6 marks)
- b) i) Define a lead compound (1 mark)
ii) Give two ways in which a lead compound might be discovered (2 marks)
- c) Differentiate between (4 marks)
i) Reversible and irreversible inhibitors ii) Uncompetitive and non-competitive inhibitor
- d) Explain the following categories of drugs that interact with DNA (4 marks)
i) Intercalating agents
ii) Topoisomerase poisons
- e) Prontosil a red dye was discovered to have antibacterial properties in vivo but not in vitro. Using a chemical equation explain why (4 marks)
- f) i) Discuss briefly the first two stages involved in the life cycle of a virus (4 marks)
- g) List why proteins are good drug targets (2 marks)

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- h) i) Define peptic ulcers (1 mark)
ii) Give four causes of ulcers (2 marks)

QUESTION TWO (20 MARKS)

- a) Discuss briefly the four levels of protein structure (8 marks)
b) Discuss briefly two mechanisms by which antibacterial agents act (4 marks)
c) List three conclusions of structure-activity relationship of penicillins (3 marks)
d) Draw the mechanism of the ring-opening of the β -lactam ring of penicillin under acidic conditions (4 marks)
e) Define a virus (1 mark)

QUESTION THREE (20 MARKS)

- a) Give four ways in which enzymes catalyze reactions (4 marks)
b) Draw the general structure of penicillin and label the parts (2 marks)
c) Write the reaction of β -lactamase deactivation of penicillin (4 marks)
d) Explain the following terms briefly with relation to drugs (4 marks)
i) Therapeutic index
ii) Selective toxicity
e) Discuss briefly the role of water and hydrophobic interactions in the interaction of a drug and its target (4 marks)
f) Explain the following terms briefly
i) Pharmacokinetics
ii) Pharmacodynamics

QUESTION FOUR (20 MARKS)

- a) Give two conclusions of the structure activity relationship of sulphonamide analogues (2 marks)
b) Discuss briefly three intermolecular bonding forces which drugs use to interact with its targets (6 marks)
c) Define the following terms in relation to enzymes (3 marks)
i) Transition state
ii) Activation energy
iii) Active site

- d) Discuss the following briefly:
- i) Fischer's lock and key hypothesis (3 marks)
 - ii) Koshland's theory of induced fit (3 marks)
 - iii) Allosteric inhibitors (1 mark)
 - iv) Suicide substrates (2 marks)
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