

**W1-2-60-1-6**

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2015/2016**

**EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE**

**SCH 2458: BIOMEDICAL AND FORENSIC ANALYSIS CHEMISTRY**

**DATE:DECEMBER 2015 TIME: 2 HOURS**

**INSRUCTIONS:** Answer question one(compulsory) and any other two questions.

QUESTION ONE

a. Briefly explain the following observations.

 i. Aspirin acts both as an analgesic and antipyretic (2 marks)

 ii. Penicillins are bactericidal where as sulphanisamides are bacteriostatic.

 (2 marks)

 iii. Protonsil is an azo dye which is active against bacteria in both in vitro and in vivo. (2 marks)

 iv. Glycerol is a waster product from manufacture of soap out is used to manufacture dynamite. (5 marks)

 v. Diptheria bacillus is Gram-positive bacteria while Typhoid bacillus is Gram – negative bacteria. (5 marks)

b. Below is a general structure of related antibiotics study the structure then answer questions that follow.

 R CO HN CH-CH C(CH3)2

 O=C--------CHCOOH

 Drug R group

 G -CH2C6H5

 F -CH2CH=CHCH2CH3

 K -CH2 (CH2)5CH3

 X -CH2 C6H5OH

i. With explanation identify the classification of these antibiotics . (4 marks)

ii. Commercial preparations of these antibiotics result into a mixture of varying proportions and describe a technique you may use to analyze them. (3.5 marks)

iii. Supposing you have a mixture of antibiotic G and K explain how you may use Fourier transform infraRed (FTIR) to determine the amount of each antibiotic in the mixture.

 (6.5 marks)

iii. “Chiral drugs should in most cases be developed as a single appropriate anantiomer” Explain. ( 5 marks)

iv. “Screening crude plant extracts is tedious and difficult activity” Explain. (10 marks)

QUESTION THREE

a. “Administration of a drug to the host or patient should be localized to the site where there is infection. In most cases this is not practical. Why? (3 marks)

b. What information might you obtain by analyzing body fluids of a person undergoing treatment using drugs? (5 marks)

c. State the characteristics of an ideal sample, pretreatment technique for samples of biological origin. (3 marks)

d. An animal is proposed to have died of heavy metal poisoning. Suggest how you would sample to be analyzed. Choose one technique and briefly explain how you may analyze for heave metal poisoning. (9 marks)

QUESTION FOUR

a. State the potential objectives of conducting tests to detect residuals from firearm discharge in a forensic laboratory. (4 marks)

b. Distinguish the terms explosive and toxic chemical weapons. (4 marks)

c. Give an outline for the chemical synthesis of the following

 i. Picric acid. (3 marks)

 ii. Mustard gas. (3.5 marks)

 iii. 2,4,6 – trinitrotoluene (TNT) (2 marks)

d. i. 2,4,6- Trinitrotoluene is superior to picric acid as an explosive. Explain.

 (1 mark)

 ii. Define the term DNA fingerprinting. (2 marks)