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University Examinations 2023/2024

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN BIOCHEMISTRY

SHC 3451: FORENSIC BIOCHEMISTRY

DATE: APRIL 2024 **TIME: 2 HOURS**

INSTRUCTIONS: *Answer question **one** and any other **two** questions*

QUESTION ONE (30 MARKS)

a) Illustrate desirable properties of biochemical tests used in localization and identification of body fluids and tissues in forensic analysis (4 marks).

b) Outline key features that make 'precipitin test' a serological technique of choice in forensic detection of blood (5 marks).

c) Explain features that have made human mitochondrial DNA a useful tool in forensic investigations compared to nuclear DNA (5 marks).

d) Describe utility of forensic serology in criminal investigations (5 marks).

e) Enumerate information that may be obtained from a proper bloodstain pattern analysis (6 marks).

f) Outline applications of forensic toxicology (5 marks).

QUESTION TWO (20 MARKS)

a) Describe the content of a crime scene supplement report and explain how the results are interpreted (10 marks).

b) Using a well labeled diagram, illustrate the processes involved in generating a DNA profile C following a crime scene (10 marks).

QUESTION THREE (20 MARKS)

a) Describe the classes of immunoassays based on the difference of labels and signal detection strategies (10 marks).

b) Devise mathematical concepts that can be used by forensic biochemists in analyzing evidence from scenes of crime (10 marks).

QUESTION FOUR (20 MARKS)

a) Discuss the use of non-human genetic materials as evidence in forensic investigations (10 marks).

b) Explain 'best practices' to consider when packaging biological evidence at a scene of crime (10 marks).