THE OPEN UNIVERSITY OF SRI LANKA

FACULTY OF HUMANITIES AND SOCIAL SCIENCES

LL.M. IN CRIMINAL JUSTICE ADMINISTRATION - LEVEL 7

FINAL EXAMINATION – 2014 / 2015

LWP 2106 - CRIMINAL INVESTIGATION I - FORENSIC TOXICOLOGY, EQD & DNA

DURATION – 03 HOURS

Date: 06th December 2015 Time: 10.00 a.m. – 1.00 p.m.

Total number of questions 7

Answer FOUR (04) questions selecting at least ONE question from each Part. Each question carries 25 marks.

Candidates will be penalized for illegible handwriting.

PART 1 - FORENSIC TOXICOLOGY

(Answer AT LEAST ONE question from this Part)

1. (i) What is Toxicology? Name three branches of Toxicology and explain what is meant by Forensic Toxicology

(ii) insecticide is one group of 'pesticide'" which could be divided in to sub groups, depending on their chemical structure. Give five different sub groups of organic insecticides.

(iii) Giving examples briefly explain the importance of the colour of a suspected poison in forensic toxicological investigations for the identification of an unknown poison.

(iv) A family visited their friend during the New Year season with an icing cake. Three people who consumed the cake developed vomiting and they were admitted to hospital. Two died while one recovered after treatments. There was vomit on the garments of the deceased and were purple in color.

(a) What is the probable poison in this particular case and why do you suspect it?
(b) What is the correct procedure in sending these samples collected by the Judicial Medical Officer and Police, to the Government Analyst Department?
(c) What specimens do you request police to collect?

(d) What specimens do you request from the doctor for toxicological analysis?

(e) Preliminary examination of this poison could be carried out by TLC. Briefly explain how you carry out TLC analysis on the extract obtained from the cake and the stomach contents of deceased. What parameter do you use in identification of poison by TLC.

2. (i) Giving examples briefly explain the method of colour tests used in toxicological analysis as screening tests.

(ii) What are the possible routes of administration of poisons? Give the order according to the severity of poisoning.

(iii) Explain how you could suspect that the death is due to injection of a poison.

(a) By examining the body at the post mortem examination

(b) From the evidence found at the crime scene investigation

(iv) A Heroin addict who was used to inject heroin every day morning was found dead on the bed and the parents suspected injection of overdose of Heroin. There was an injection syringe near the body. The post-mortem examination was carried out by the JMO.

(a) What is the main organ where drug metabolism takes place? Which is the main organ responsible for excretion of drugs?

(b) Giving Special attention to the metabolism what are the most suitable specimens you recommend to the JMO to collect in this case

(c) What is the most suitable specimen to be analyzed in this case?

(d) What specimens do you request the police to collect?

(e) If a sample of urine was submitted for examination, briefly explain how you carry out solid phase extraction to extract heroin and the metabolite Morphine from urine?

(f) What is the specific colour test you can use to identify heroin?

3. (i) The severity of poisoning depends on the physical form of a poison i.e. solid, liquid etc. Give the order of severity of poisoning according to the physical form.

(ii) A couple with their small daughter stayed in a hotel room and developed abdominal pain and vomiting in the night .They were admitted to hospital, the daughter and the mother died while the father recovered after treatment. The Investigations on

the incident revealed that the adjacent room was closed and sealed with Aluminium Phosphide inside the room to kill bugs.

(a) What is the poisonous gas evolving from Aluminium Phosphide?
(b) According to the pesticide classification what is the class of Aluminium Phosphide? (Fungicide, Herbicide etc.) .
(c) Explain why this poison has seriously affected the victims.

(iii) Methyl alcohol is highly poisonous compared to Ethyl alcohol.

(a) Giving a case example, explain the specific symptoms that could be seen in a case of Methyl alcohol poisoning.
(b) Explain the metabolic pathway when it enters liver and give the name of the compounds including metabolites that could be detected in blood and urine in a case of Methyl alcohol poisoning.
(c) Do you think that this poison is suitable to be used as a homicidal poison? Explain with reasons.
(d) What is the most suitable analytical method to be used in the analysis of this poison in blood? Briefly explain the theory of this technique.

PART 2 - EXAMINATION OF QUESTIONED DOCUMENTS (EQD)

(Answer AT LEAST ONE question from this Part)

4. Documents can be fraudulent in numerous ways and can be disputed for various reasons and on many grounds

(a) What are the most common types of forgeries encountered in forensic document examination?
(b) How do you get services of a qualified and experienced document examiner to establish fact in your case ?

5. With the development of modern office organization the demand for more rapid ,efficient and economical reproduction has increased

   (a) What are the different kinds of documents reproduction techniques?

   (b) At present special attention has been paid to the cases pertaining to crimes which involved bribes and corruptions. What are the main scientific evidence to be established in that type of cases?

PART 3 - DNA

(Answer AT LEAST ONE question from this Part)

6. Briefly explain the following
   (i) The Locard's principle.
   (ii) Blood pattern analysis in crime scene investigation.
   (iii) Preliminary tests and confirmatory tests in the investigation of blood
   (iv) Chain of custody of case production

7. (a) Write short notes,
   (i) DNA fingerprinting.
   (ii) Application of DNA fingerprinting in crime scene investigation.

   (b) What are the important factors to be considered when samples are obtained for DNA testing?