

**ELIZADE UNIVERSITY, ILARA-MOKIN,  
ONDO STATE, NIGERIA**

**FACULTY OF BASIC & APPLIED SCIENCES  
DEPARTMENT OF BIOLOGICAL SCIENCES  
FIRST SEMESTER EXAMINATION  
2016/2017 ACADEMIC SESSION**

**COURSE CODE: BTH 406**  
**COURSE TITLE: FORENSIC BIOLOGY**  
**DURATION: 2 HOURS 30 MINUTES**

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**HOD'S SIGNATURE**

**NAME:.....MAT. No:.....**

**INSTRUCTIONS**

**Answer four (4) questions in all: Any two questions from Section A, and any two (2) questions from Section B. Each question is 15 Marks.**

## SECTION A

- 1) (a) What is DNA barcoding?  
 (b) State the characteristics of the Cytochrome C Oxidase subunit I (COI) mtDNA gene that makes it appropriate gene for DNA barcoding in animals.  
 (c) What genes options are available for plant barcoding?
  
- 2) (a) Briefly explain the setback of the conventional fingerprints such as retinal scans and palm print in identification and security cases.  
 (b) Outline the steps involved in DNA fingerprinting.  
 (c) Explain five applications of DNA fingerprinting.
  
- 3) (a) Based on the 'Locard's Exchange Principle', criminals are likely to leave genetic materials at crime scenes. List the DNA sample types collectable from scenes of homicide, sexual assaults and property crimes.  
 (b) Differentiate between trace, biological and comparative evidences found at crime scenes.  
 (c) What is evidence collection **priority at a scene of crime?**

## SECTION B

- 4) Three baby boys were born in the same morning in the same hospital. That morning, the hospital had started using new identification bracelets. When the babies were bathed, the identification bracelets slipped off and nurses thought a mixed-up might have occurred. Given the information from the DNA profile in Figure 1, determine:
  - i. Which baby belong to the Meanys?
  - ii. Which baby belong to the Glicks?
  - iii. Which baby belong to the Moes?
  - iv. Is it possible for a child to have a DNA band that is not found in the mother? Why?

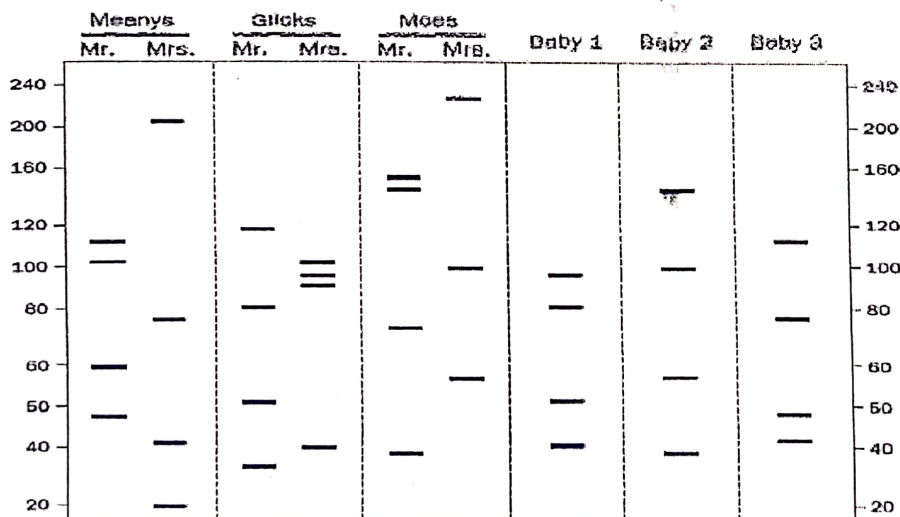


Figure 1

5) One afternoon, a break-in occurred at a high school, and several computers were stolen. At the time of the break-in, the building was empty. A motion detector tripped by movement in one of the hallways alerted the police. When the police arrived to investigate, they found that one of the doors leading into the school had been propped open with paper wedged in the door jam. The door appeared to be locked, but it could be easily pushed open. Near the door, police found a cold soft drink can. Because of the cool temperature of the drink, police suspected that the can was left by one of the intruders. The can was bagged as evidence and a DNA sample was obtained from the lip of the can. The neighborhood was canvassed, and a clerk in a convenience store remembered selling canned soft drinks to two young males just before the break-in occurred. The surveillance video in the convenience store was examined, and the clerk provided the police with the names of all males who were in the store just prior to the break-in. Three suspects were identified from the video, and blood samples and conventional fingerprints were collected from the suspects. Given the DNA fingerprints in Figure 2:

- i. Does the DNA from the crime scene match the DNA from any of the suspects?
- ii. Are there more than one DNA match? Explain.
- iii. Is the DNA profile sufficient to convict a suspect? Explain.

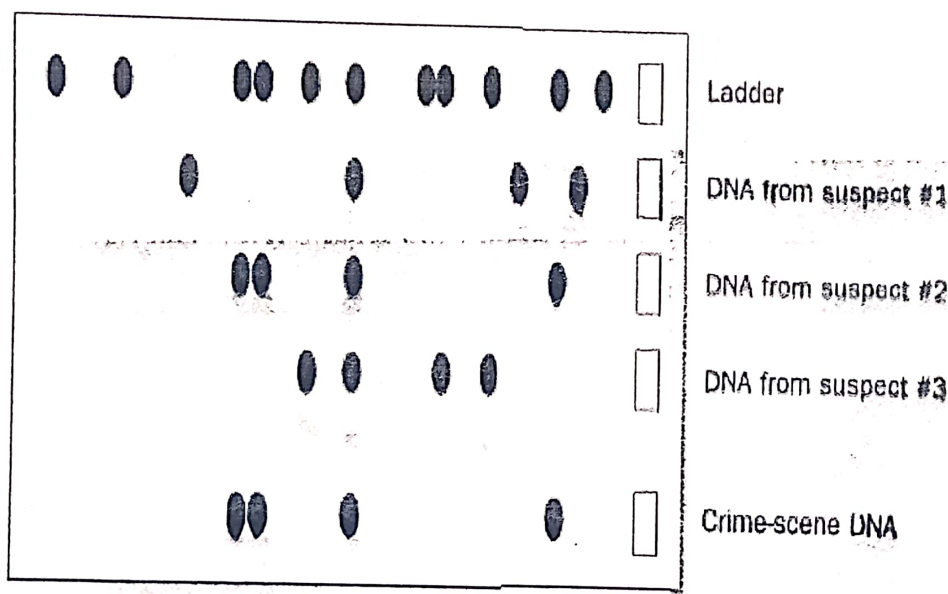


Figure 2

- 6) Four individuals were samples from a supposed family pedigree. The pattern revealed by the DNA fingerprint suggests that individual A, was the father of individual C, a male. Individual B was a female, whose relation with individual C was unknown. Individual D was another female whose relationship with C, a male, was unknown. Using the fingerprint in Figure 3;
- i. What is the relationship of B with C?
  - ii. What is the relationship of D with C?

