



**Department of  
Pure and Applied Chemistry**

**Examination for the degree of MChem**

MChem Forensic and Analytical Chemistry

## **CH554 Specialisation Chemistry: Paper A**

Forensic Science Principles And Practice Part 2 (CH560)

**Friday 15<sup>th</sup> December 2023**

**Start: 14:00**

**Duration: 50 min**

You must answer **ONE** question from a choice of **TWO**.



**Forensic Science Principles And Practice Part 2 (CH560)**

1. Answer **ALL FOUR** parts (a) – (d).
- (a) In relation to **Scenario 1.1**:
- (i) Identify Source, Activity, and Offence level propositions and discuss whether Sub-source level propositions should be addressed or not. [5]
- (ii) Calculate the Likelihood Ratios at Source and Activity level for the blood evidence. [7]
- (b) List **THREE** organisations whose quality standards forensic laboratories in Scotland must comply with. [1]
- (c) Compare and contrast the effectiveness of **THREE** different methods to measure the competency of a trainee forensic examiner. Determine which, in your opinion, is the most the effective. [9]
- (d) Explain **TWO** types of cognitive bias that might affect a forensic scientist. Illustrate your answer using a scenario. [3]

**Scenario 1.1**

The deceased victim of a hit-and-run has blood type AB negative. A suspect has been identified, and apparent AB negative blood found on their car. Information on the frequency of blood types is found in **Table 1.1**. Note that the probability of transfer of blood during hit-and-run is 0.75 and background blood is present on 0.9% of cars in the population.

**Table 1.1.** Blood type database

|    | <b>Positive</b> | <b>Negative</b> | <b>Total</b> |
|----|-----------------|-----------------|--------------|
| 0  | 3015            | 606             | <b>3621</b>  |
| A  | 2433            | 300             | <b>2733</b>  |
| B  | 270             | 112             | <b>382</b>   |
| AB | 115             | 84              | <b>199</b>   |
|    |                 |                 | <b>6935</b>  |

2. Answer **ALL FIVE** parts (a) – (e).
- (a) In relation to **Scenario 2.1**:
- (i) Justify why you should always choose to switch your pick to B. [6]
- (ii) Discuss why a forensic scientist should understand the reasoning behind this example. [7]
- (b) List the stages of the non conformity reporting process. [1]
- (c) Compare and contrast the two quality components to determine if, in your opinion, one is more effective at ensuring that a forensic laboratory can provide a high quality service [6]
- (d) State **TWO** terms that are inappropriate for use in a court report and explain why. [2]
- (e) Explain the association between fact and opinions in writing Court Reports. Illustrate your answer with a forensic example. [3]

### Scenario 2.1

You are the participant in a game show. There are three individuals (A, B and C) in front of you. One is the “banker”, two are “impostors”, and your goal is to identify the “banker”. You pick A, after which the presenter tells you that C was an “impostor”. Note that the presenter would never identify the “banker”. Now, the presenter asks you to confirm whether you want to stick with A or switch to B.

**END OF PAPER**

*FC, LR*