

## CTSI Professional Competency Framework (CPCF) written examination

### Unit 4: Laboratory Equipment - Metrology

**May 2024**

### Guidance for this examination

Please ensure that you indicate clearly at the top of the answer booklet, the law viewpoint from which you will be answering: English, Scottish or Welsh.

The examiners may expect candidates to show knowledge of legislation which is in place but not in force (i.e., has been enacted) and regulations which have been made but are not yet in force, if they are directly relevant to the subject-matter of the examination.

### Examination structure

This examination paper is 1 hour 30 mins (plus ten minutes' reading time)

Total of 5 questions.

Candidates should attempt **all** questions.

Please be aware that each question has been given a mixture of marks available (identifiable against each question).

### Note:

The Laboratory Equipment – Metrology paper is a **closed book**; no materials are permitted to be taken into the examination room.

*The examination paper has **(2)** pages, including this front sheet.*

Candidates should attempt to answer all questions.

1. Define the statements below and state when they are applicable, with examples.

- Setting the meniscus
- Borda's method of substitution
- Significant contribution to uncertainty budget
- OIML G14
- ILC

(20 marks)

2. A technician queries a stated value for a mass on one of the calibration certificates issued by your calibration provider and asks for clarification on the validity of the result. Describe the processes you would follow to determine whether the technician has genuine concerns and what internal quality control checks you could perform to investigate the validity of the provided calibration value.

(30 marks)

3. A client would like to have a brass pycnometer calibrated to your best uncertainty capability. Explain the procedure for conducting such a calibration and how you would ensure the validity of your method.

(20 marks)

4. The environment in a metrology laboratory can have severe effects on achieving good measurements. Outline those that can have an adverse effect on mass calibrations and state how they can be minimised or taken into account with regard to measurement uncertainty.

(20 marks)

5. Your quality manager has asked you to assess the competence of a new technician. Explain how you intend to meet this direction.

(10 marks)

**Total of 100 marks.**

**End of exam paper.**