

## Examiner's report

### CTSI Professional Competency Framework

#### Stage 2: Weights and Measures Written Report September 2022

##### General

This was the September paper for Weights and Measures exam under S73 of the Weights and Measures Act 1985. There was only one candidate.

The marking scheme allows marks to be awarded for the use of specific terms and phrases, when this is combined with a pass mark of only 40% it is relatively easy for candidates to gain sufficient marks to pass the exam without demonstrating the requisite understanding of the subject matter being examined. This point has been noted in successive examiners reports.

##### Section A

###### Q1

With respect to a non-automatic weighing instrument what is a module? Explain your answer by reference to one of the modules defined in EN45501 (2015)

This question relates to understanding the modular approach as outlined in EN 45501, WELEMC 8.8 and WELMEC 2.4 This is an important area of understanding for the operation of weights and measures law and is often part of the examination.

###### Q2

(a) Briefly distinguish between an automatic catch-weigher and automatic check-weigher referring to the accuracy classes which apply to each.

(b) Briefly outline the legislation that would apply to an automatic checkweigher used for checking packages covered by the Packaged Goods Regulations 2006

This question is examining whether students were able to distinguish between the two similar types of instruments and briefly outline the characteristics of both by referencing the relevant legislation. This is an area candidates often get confused and is important to understand as they will come across it in their professional lives.

The second part is testing if candidates understood the relationship between the Packaged Goods Regulations (Regulation (9)) and check-weighing instruments

###### Q3

What are a local weights and measures authority and what are their responsibilities?

This question is an easy question if the candidate has read and understood S69 of the Weights and Measures Act 1985

###### Q4

(a) What are the main requirements for weights outlined in OIML R111 (2004)?

(b) What category of weights would a manufacturer use to initially conform to assess a weighing instrument used for commercial transactions by a quarry and what is the maximum allowed total error of the weights used?

This question is an easy question if the candidate has read and understood OIML R111. The second part of the question is examining if the candidate understood the relationship of the different categories of weights and which tasks they can be used for and the relationship with EN45501 relating to the maximum total errors permitted on test loads,

#### Q5

What is the significance of the CE mark, and can it continue to be used in the UK after the departure of the UK from the EU? Explain your answer in terms of Weights and Measures Legislation.

This question is testing the candidate's knowledge of the significance of the CE mark and transition between the CE mark and the UKCA mark. This is a complicated but important area of understanding, made more difficult by rapidly changing legislation. The candidate must make sure they are fully aware of the latest legislation at the time of their exam.

#### Q6

You have a weighing scale manufacturer in your area. Since the UK departure from the EU, they have noticed an increase in the number of requests for instruments that can weigh in imperial units. They would like to know if they could design and build an instrument that can be used for trade and weigh in imperial units. What advice would you give them? Explain your answer.

This question is testing candidates' understanding of the legislation as it relates to units of measurement and weighing instruments. It involves a knowledge of the Units of Measurement Regulations 1986, the Essential Requirements of the Non-automatic Weighing Instruments Regulations 2016, and section 8 of the Weights and Measures Act 1985 and understanding how these interact.

## Section B

#### Q7

You are an Inspector of Weights and Measures working for a local weights and measures authority in the far north of the United Kingdom. As a result of budget cuts, the authority is not an approved body. The authority is carrying out a project to check for the compliance of weighing instruments used in local jewellers. You visit a local business and carry out an inspection of the non-automatic weighing instrument that you find there. It has a CE mark and the other relevant legal metrology markings including the suffix 17 after the metrology mark. The instrument is 600g x 0.01g

(a) List seven of the markings besides the CE mark, that you may expect to see on the instrument

This is an easy question which requires the candidates to memorize the necessary markings required for a legally controlled weighing instrument. If the candidate knows these markings full marks will be obtained.

(b) What advice would you give him if he wished to replace the instrument in your authority next year with

This question is testing whether the candidate understands the requirements for the transition from the CE to the UKCA mark. This involves an understanding of the legislation as it applies at the time. This is complicated as the legislation changes very regularly.

(c) Explain in detail the metrological tests you would carry out to ensure that the instrument continues to comply with the Non-Automatic Weighing Instruments Regulations 2016 (as amended)

This question is testing whether the candidate has understood the implications of section 8.3 of the EN45501(2015) and the procedures for testing a non-automatic weighing instrument. This question

arises in different forms each year and the candidate must be aware of how to undertake this. The candidate should note the number of marks awarded to the question as this will reflect the amount of detail necessary.

### Q8

You are approached by a local farmer who intends to undertake contract farming for other local farms. He explains he plans to charge his customers by the hour for the work completed and by the litre for the volume of fuel used. The charge for the fuel will be determined by an old liquid fuel measuring instrument at his farm that he has used to fill up his own vehicles. He invites you to the farm to discuss the proposal and to look at the liquid fuel measuring instrument. You notice the instrument is not networked to any other devices. The instrument has a data plate which shows the date of manufacture as 2008 it bears a CE mark and M mark and other relevant markings but no conformity assessment markings.

(a) What advice would you give the farmer about using the liquid fuel measuring instrument to determine how much to charge his customers

The candidate will be expected to note that as the farmer intends to sell the fuel to his customers and use the petrol pump to determine that quantity it will be in use for trade as defined in section 7 of the Weights and Measures Act. It must therefore be approved and verified. The candidate will also be expected to note that when the instrument is verified it will be a new instrument and must comply with all requirements when it is placed on the market which may be problematic

(b) The farmer enquires whether he must sell the fuel quantity. What advice would you give him?

This question is testing whether the candidate understands that a weighing or measuring instrument does not have to be used to determine a transaction, but if it is used it must be approved and verified. This means that the farmer could incorporate the cost of the fuel into the total contract cost if the fuel element was not based on quantity.

(c) After further investigation you discover that the instrument used by the farmer could not be initially conformity assessed as the type-examination had expired. He decides to purchase a new instrument and asks you to conformity assess the instrument. What physical tests would you undertake and what errors would you apply and what legal metrology marks would you expect to apply to the new instrument to ensure it is fully compliant with the legislation. The new instrument is initially conformity assessed by you in September 2021

This question is testing whether the candidate knew how to undertake the initial conformity assessment of a liquid fuel measuring instrument. If the candidate was aware of this, they would score very high marks

(d) The owner of the liquid fuel measuring instrument would like to connect it to his new computer system and print invoices for any fuel sold. Would this be possible, explain your answer

This question was testing whether the candidate understood that a liquid fuel measuring instrument was part of a meter measuring system, and it was necessary that the entire system be subject to initial conformity assessment. This means that the instrument can be connected to a new computer system but that the measuring parts of that system must be subject to conformity assessment. The candidate should understand the context and implications of the WELMEC Guide 7 series about software

(e) What function does the pulser serve in a liquid fuel measuring instrument and should it be sealed after the conformity assessment

If the candidate understood how a pulser works, it was a very easy question. It confirms the need for candidates to understand how weighing and measuring equipment works as well as the laws that govern it.

## Q9

You work for a local authority approved body and have been approached by a local business in your area that would like to place material measures of length on the market in the UK. He has manufactured material measures of length previously in 2012 and he still has a number of these available to be sold in his factory shop. These bear a CE mark, an M mark, and a notified body number. He would also like to import instruments from France next year that have not undergone a conformity assessment procedure and do not bear any metrology conformity assessment marks. He would like advice on what steps he should take to enable him to supply these instruments in the UK under the Measuring Instruments Regulation's 2016 (as amended)

(a) Can they legally supply the instruments he has in the store in the UK. Explain your reasons?

This question focuses on testing whether the candidate understands the concepts of placing on the market and putting into service and the effect that this will have in the context of the transition to UKCA marks

(b) What advice would you give them with regarding the conformity assessment procedures necessary to place the newly manufactured measures on the market in the GB and who should carry those out

This question is testing the candidates understanding of the conformity assessment modules that apply to material measures of length. There have been many questions regarding the different types of conformity assessment modules that apply to different instruments and candidates should be comfortable with these

(c) What is the significance of the OIML Document R35? Explain the three categories error that must be applied? Briefly explain how you would undertake a verification

OIML R35 is the normative document relating to material measures of length. The three categories of error and the method of test can be found in OIML R35

(d) Can the material measure of length be conformity assessed in both metric and imperial units for the GB market? Briefly explain your answer.

This question is testing candidates understanding of the legislation as it relates to units of measurement and weighing instruments. It involves a knowledge of the Units of Measurement Regulations 1986, the Essential Requirements of the Non-automatic Weighing Instruments Regulations 2016, and section 8 of the Weights and Measures Act 1985 and schedule 1 and 3 of that Act and understanding how these interact together

(e) A local veterinary practice would like to purchase a material measure of length marked in hands. Is this possible?

This is a question testing an understanding of section 7 and schedules 1 and 3 of the Weights and Measures Act 1985 and the use of imperial units

## Q10

This question is asking the candidate to briefly outline the requirements of the Packaged Goods Regulations 2006. It is very important that candidates understand the Packaged Goods Regulations as there is a question on one form or another every year

a) What is a measuring container bottle?

The definition of a measuring container bottle is in the Regulations 76/211. If the candidate knows this definition, they should get full marks for this answer

b) What is standard temperature accounting? They would like you to explain what guidance is available on this matter. Outline briefly to them how you would inspect a liquid fuel measuring instrument that utilizes standard temperature accounting marks

The answer to the question lies in the Guidance notes issued by OPS&S (STA Guidance (V13) and the “Standard temperature accounting layman’s guide”) A candidate must be aware of the Guidance and the practical implications

(c) They asked which WELMEC Guide relates to the control of software in weighing and measuring equipment? Explain the structure of the Guide that relates to instruments under the Measuring Instruments Regulations 2016 and briefly explain what software identification that you would expect to find on a liquid fuel measuring instrument

The WELMEC Guides that relate to software are known as the WELMEC 7 Guides. The most significant one of the Guide 7.2 Under the Guide 7.2 the Instrument are broken down into two main categories: Type P (purpose-built) or U (universal: PC...) and then extensions are added on

Extensions:

- L (long-term storage)
- T (transmission)
- S (software separation)
- D (download)
- I (instrument-specific requirements)
- O (Operating systems)

The answer would need to distinguish between Type P and Type U, what the main extensions are and what they mean. It would also need to explain the risk classes that would be attached to each type of instrument

A petrol pump would be Type U with a range of possible extensions. Likely to be risk class C which would mean that you would expect to see a checksum

(d) The trainee has a project to advise a local producer of yoghurt. The pots are marked 250ml and are filled to the top he uses no weighing or measuring equipment for the process. The packer would like to know how he can make the process fully compliant with The Packaged Goods Regulations 2006 (2006/659)