

Qualification Framework written examination

Unit 4: Weights and Measures

September 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

There are two sections to the examination paper:

Section A Consists of six questions.
Candidates should attempt to answer three questions.
Total allocation of marks is 30 marks.
Suggested time allocation is 30 minutes.

Section B Consists of four questions.
Candidates should attempt to answer two questions.
Total allocation of marks is 70 marks.
Suggested time allocation is 90 minutes.

Total time allowed – two hours (plus ten minutes' reading time).

Note:

The Weights and Measures paper is a **closed book**; no materials are permitted to be taken into the examination room.

The examination paper has 5 pages, including this front sheet.

Section A

Candidates should attempt to answer three questions.

Each question carries ten marks.

Total: 30 marks.

1. A local builder's merchant in England is selling sand in 500kg and one ton bulk bags, both of which are open at the top. He also has a branch in Scotland. Explain to the trader if he is complying with the law?
(Total: 10 marks)
2. Explain briefly what an analogue data processing device is and explain its function in a weighing instrument.
(Total: 10 marks)
3. Explain the role of the BIPM.
(Total: 10 marks)
4. Explain briefly what is meant by the term *compatibility of modules*.
(Total: 10 marks)
5. Giving an example, briefly explain the requirements that relate to food in a liquid medium regarding weights and measures and other relevant requirements.
(Total: 10 marks)
6. Briefly explain the term "putting into use" with regard to weights and measures legislation.
(Total: 10 marks)

Section A total of 30 marks.

End of Section A.

Section B
Candidates should attempt to answer two questions.
Each question carries 35 marks.
Total: 70 marks.

7. Answer all parts of the question

- a) You discover that a local garden centre is selling loose fruit and vegetables with unit pricing in pounds and ounces. What advice would you give the garden centre with respect to this?

Explain your answer with reference to Weights and Measures and Prices Legislation.

(10 marks)

- b) They sell single chillis. They would like to sell these at a price per 100g. Can they do this?

Explain your answer.

(5 marks)

- c) There are several checkout scales that you decide to check. The data plate on the side of the instrument is marked as 15kgx5g, the minimum load as 100g, and is CE marked with the appropriate conformity assessment marks. The marks show it was placed on the market in 2015. The display on the customer facing indicator (the display on the pole) is marked with 15kgx2g and a minimum load of 40g. When asked to explain this discrepancy, they explain that the indicators on the pole were from different instruments and have been connected to save on the cost of repairs.

Explain with reference to weights and measures legislation, if they can use the instruments for commercial transactions.

(5 marks)

- d) You decide to undertake a metrological inspection of the instrument to check for compliance with the essential requirements. Outline the tests you would undertake and the errors you would apply at 2.5kg (500e). You use the data plate on the side of the instrument.

(15 marks)

(Total: 35 marks)

8. Answer all parts of the question

- a) You have been asked by a local packer of yoghurts to assess the packing process and advise on their legal obligations under the Packaged Goods Regulations 2006 and other relevant legal requirements. The yoghurts are 150ml pots and are e-marked. Outline the rules that the packer must meet with regard to the quantity of the packs.

(5 marks)

- b) To fill the pots of yoghurt, the packer uses an automatic gravimetric filling instrument that has a type of examination certificate and has been initially conformity assessed by the manufacturer of the instrument. What, if any, packing records do they need to keep?

(6 marks)

- c) The packaging of the yoghurt is predominantly white, and the colour of the weight marking will be grey. Comment on whether you think this colour choice would be acceptable.

(4 marks)

- d) They wish to put the weight marking on the bottom of the carton and the use by date on the top.

Explain in terms of weights and measures and other relevant legislation, if this can be done.

(10 marks)

- e) They also pack orange juice into pint bottles for a local door-step delivery service.

Explain if this is legal.

(4 marks)

- f) If you carry out a reference test on the bottles of orange juice, explain how you would decide whether it should be a destructive or a non-destructive test.

(6 marks)

(Total: 35 marks)

9. Answer all parts of the question

You are completing some inspections at a fuel station in your authority. The pumps bear the appropriate conformity assessment marks. They are networked to a POS system in the kiosk of the petrol pump. You examine the pulser and notice that there is a security seal missing.

- a) Explain what the pulser is and how it works.

(10 marks)

- b) What actions could you take regarding the pulser not having the security seal?

(5 marks)

- c) Further inspection of the pump reveals a security seal is missing in the calculator. This seal secures a cover which prevents a USB flash drive being inserted into the calculator. Why would the petrol pump have the facility for USB flash drive to be inserted in the calculator, and why should it be sealed?

(5 marks)

- d) You decide to test the liquid fuel measuring instrument to see if it complies with the accuracy requirements of the schedule 1 and 1F of the Measuring Instrument Regulations 2016. What physical tests would you undertake and what errors would you apply?

(10 marks)

- e) The software on the liquid fuel measuring instrument is identified by means of a checksum. What is the significance of checksum in the context of legal metrology software?

(5 marks)

(Total: 35 marks)

10. Answer all parts of the question

You are approached by a manufacturer of intoxicating liquor measuring instruments for the UK market. He asks for your advice with regard to his responsibilities to the Weights and Measures Act 1985 and other relevant weights and measures legislation.

- a) What advice would you give?
(6 marks)
- b) He would like your advice on the requirements that relate to approved verifiers and what steps he should undertake to achieve this. What advice would you give?
(6 marks)
- c) Would he have to conformity assess every intoxicating liquor measuring instrument or could a sample from each production run be tested and then the entire production run be verified?
(6 marks)
- d) Can he sell the intoxicating liquor measuring instruments in all four nations of the UK?
Explain your answer.
(4 marks)
- e) The manufacturer would also like to initially conformity assess capacity serving measures of a capacity of 25ml and 50ml. Outline the conformity assessment procedures that would be available to place these on the market in Great Britain.
(8 marks)
- f) What markings would be required on the capacity serving measure before it was placed on the market?
(5 marks)

(Total: 35 marks)

Section B total of 70 marks.

END OF EXAMINATION PAPER.