

Qualification Framework written examination

Unit 4: Weights and Measures

November 2025

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 (6) pages, including this front sheet.

Section A

Candidates should attempt to answer three questions.

Each question carries ten marks.

Total: 30 marks.

1. Distinguish between type P software and type U software. (10 marks)

2. With reference to the Weights and Measures Act 1985 and relevant regulations, explain what a working standard is. (10 marks)

3. With reference to the relevant documents and standards, explain what a compatibility of modules assessment is. (10 marks)

4. Distinguish between a checkweigher and a weigh price labeller. (10 marks)

5. Briefly explain what a gravimetric filling instrument is, referring to the relevant legislation and technical documentation. (10 marks)

6. With reference to EN45501:2015, distinguish between a primary display and a secondary display. (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.

You visit your local authority highways depot. This is run by a recently contracted private business, and they have completely revamped the site, putting in a new weighbridge. They charge the Council for the amount of grit they use on the roads, and this is determined by a weighbridge at the site.

An inspection of the weighbridge reveals it bears a CE mark and a letter M in a rectangle but does not have the identification number of either an approved body or a notified body. The weighbridge has a maximum capacity of 50 tons and the $e=20\text{kg}$. It bears all the inscriptions that would be expected including a type-examination number from a European Notified body.

- (a) With reference to the Non-automatic Weighing Instruments Regulations 2016, explain whether the agreement between the contractor and the Council is valid.

What advice would you give them?

(5 marks)

- (b) The authority you are employed by is an approved body for the purposes of module F. Explain briefly the role of a module F approved body.

(5 marks)

- (c) The contractors that operate the weighbridge ask if your authority can conformity assess the weighbridge. Explain your answer and offer any solutions that may be appropriate.

(10 marks)

You decide to inspect the weighbridge. Your department has a policy that inspections of non-automatic weighing instruments will follow the same procedure as initial conformity assessment.

- (d) Outline in detail the metrological tests that you would undertake, specifying the load points you would use and the maximum permissible errors you would apply.

(15 marks)

Maximum permissible errors	For loads, m , expressed in verification scale intervals, e			
	Class I	Class II	Class III	Class IIII
$\pm 0,5 e$	$0 \leq m \leq 50\ 000$	$0 \leq m \leq 5\ 000$	$0 \leq m \leq 500$	$0 \leq m \leq 50$
$\pm 1,0 e$	$50\ 000 < m \leq 200\ 000$	$5\ 000 < m \leq 20\ 000$	$500 < m \leq 2\ 000$	$50 < m \leq 200$
$\pm 1,5 e$	$200\ 000 < m$	$20\ 000 < m \leq 100\ 000$	$2\ 000 < m \leq 10\ 000$	$200 < m \leq 1\ 000$

(Total: 35 marks)

Section B continues over the page.

8. Answers all parts of the question.

You have visited a local packer of chocolate bars. They pack chocolate in 200g and 400g bars and also gift packs of 5 x 200g bars.

You carry out a check of the weights of the 200g chocolate bars, and they vary between 180g and 210g including the wrappers. You weigh 30 bars as they reach the dispatch area of the production line and 12 of them are below 191g. The owner of the business estimates that the hourly production is about 200 bars per hour.

- (a) Outline the three packers' rules that must be met by the packer, giving the tolerable negative error for the 200g bars. (5 marks)
- (b) From the results of the 30 packages, explain if you think the packer has met these rules. Refer to the attached tables from the Packaged Goods Regulations (see below). (10 marks)
- (c) How would you decide if a reference test should be destructive or non-destructive? (5 marks)

You see that the packer does weigh some of the packages to ensure that they are the correct weight. You inspect the scale and see that it does not have any conformity assessment marks. It is a 6kg instrument with 2g divisions.

- (d) Outline the duties of the packer regarding the checks, documentation and equipment necessary to ensure compliance with The Weights and Measures (Packaged Goods) Regulations 2006, referring to both the regulations and any relevant guidance notes. Explain whether the equipment they are using is compliant. (10 marks)
- (e) Briefly outline the marking requirements relating to weights and measures legislation regarding the outer container of the 5 x 200g packages. (5 marks)

<i>Nominal quantity in grams or millilitres</i>	<i>Total negative error</i>	
	<i>As a percentage of nominal quantity</i>	<i>g or ml</i>
5 to 50	9	—
from 50 to 100	—	4.5
from 100 to 200	4.5	—
from 200 to 300	—	9
from 300 to 500	3	—
from 500 to 1,000	—	15
from 1,000 to 10,000	1.5	—
from 10,000 to 15,000	—	150

(Total: 35 marks)

Section B continues over the page.

9. Answer all parts of the question.

You have been undertaking some recent pub inspections, and a local Polish bar is selling their draft beer in 500ml glasses. You notice that the glasses bear a CE mark, and the identification number of an EU notified body.

- (a) Is it legal to sell the draft beer in these quantities? Explain your answer. (5 marks)
- (b) Referring to all relevant legislation and normative documents, comment on whether the 500ml capacity serving measure can be placed on the market. (7 marks)
- (c) The landlord would also like to sell "Steins" of 1 1/2 pints. What advice would you give him? (3 marks)
- (d) The landlord has a wide range of Polish and Eastern European spirits. He seeks your advice on the Weights and Measures legislation relating to the sale of spirits and the equipment he should use. Making reference to relevant legislation, what advice would you give him? (10 marks)
- (e) You decide to inspect the intoxicating liquor measuring instruments that he is using to dispense the gin, rum, vodka and whisky. Comment on the markings you would expect to see. (5 marks)
- (f) Distinguish between an approved pattern of equipment and a type-examination certificate. (5 marks)
- (Total: 35 marks)

Section B continues over the page.

10. Answer all parts of the question

You are going to undertake some petrol inspections and, before you go out, you decide to fill the van with fuel at the local council-owned depot. In front of you in the queue for the petrol pump is an ambulance from the local ambulance service. After they have filled the ambulance with fuel, they pay with a card and receive an automatically printed receipt.

A quick glance at the pump reveals that it is marked with a CE and an M, but does not bear the identification mark of a notified body. The receipt was delivered by an outside payment terminal (OPT).

- (a) Do you think this liquid fuel measuring instrument is compliant with Weights and Measures legislation? Explain your answer and the advice you would give. (5 marks)

You decide to go back and inspect the liquid fuel measuring instrument. You have a colleague with you who is new to legal metrology, and he asks you to point out parts of a liquid fuel measuring instrument and explain what they do.

- (b) Draw a schematic of a meter measuring system, labelling the main parts. (15 marks)

- (c) Explain the function of an air separator and how it works. (Use a diagram if required). (5 marks)

You decide to test the liquid fuel measuring instrument to see if it complies with the accuracy requirements of The Measuring Instruments Regulations 2016.

- (d) What physical tests would you undertake? What errors would you apply? (10 marks)
(Total: 35 marks)

Section B total of 70 marks.

END OF EXAMINATION PAPER.