2.1 Measurements & Errors

Question Paper

Course	CIE A Level Physics (9702) 2019-2021
Section	2. Measurement Techniques
Topic	2.1 Measurements & Errors
Difficulty	Easy

Time allowed: **10**

Score: **/10**

Percentage: **/100**

Question 1

A student carries out a series of determinations of the acceleration of free fall *g*. The table shows the results.

g / m s^{-2}
4.91
4.89
4.88
4.90
4.93
4.92

What can be said about this experiment?

A it is accurate and precise

B it is accurate but not precise

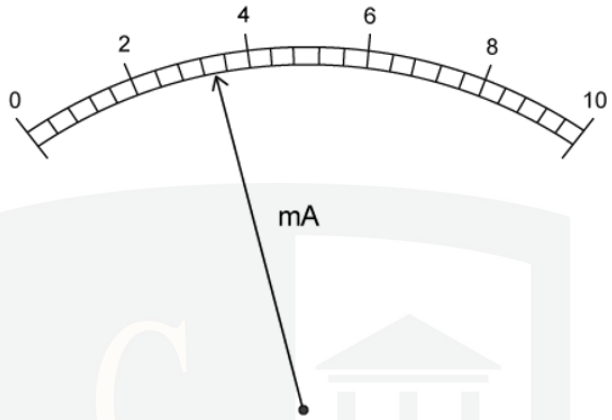
C it is not accurate and not precise

D it is not accurate but is precise

[1 mark]

Question 2

What is the reading shown on this milliammeter?



A 2.35 mA **B** 2.7 mA **C** 3.4 mA **D** 3.7 mA

[1 mark]

Question 3

A micrometer is used to measure the diameters of two cylinders.

diameter of first cylinder = 12.78 ± 0.02 mm
diameter of second cylinder = 16.24 ± 0.03mm

The difference in the diameters is calculated.

What is the uncertainty in this difference?

A ± 0.01mm **B** ± 0.02mm **C** ± 0.03mm **D** ± 0.05mm

[1 mark]

Question 4

An experiment is done to measure the acceleration of free fall of a body from rest. Which measurements are needed?

A the height of fall and the time of fall

B the height of fall and the weight of the body

C the mass of the body and the height of fall

D the mass of the body and the time of fall

[1 mark]

Question 5

The diagrams show digital voltmeter and analogue ammeter readings from a circuit in which electrical heating is occurring.

What is the electrical power of the heater?

A 0.53W **B** 0.58W **C** 530W **D** 580W

[1 mark]

Question 6

A metre rule is used to measure the length of a piece of wire. It is found to be 70 cm long to the nearest millimetre.

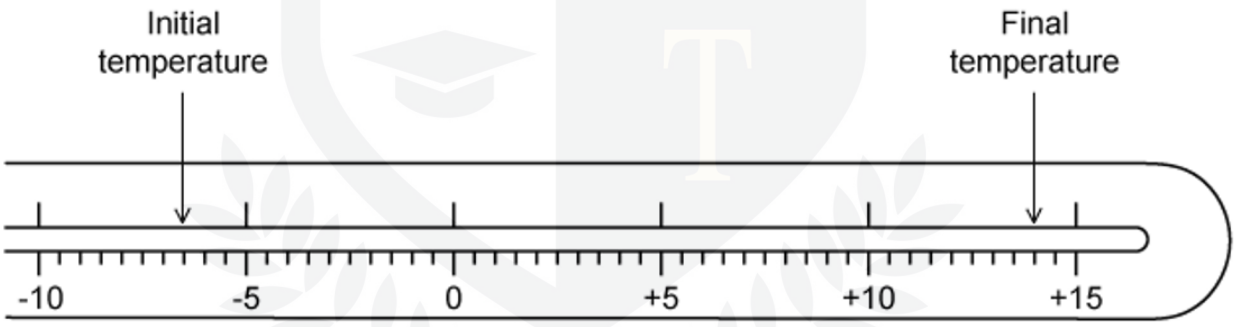
How should this result be recorded in a table of results?

A 0.7m **B** 0.70m **C** 0.700m **D** 0.7000m

[1 mark]

Question 7

The diagram shows the stem of a Celsius thermometer marked to show initial and final temperature values.



What is the temperature change expressed to an appropriate number of significant figures?

A 14°C **B** 20.5°C **C** 21°C **D** 22.0°C

[1 mark]

Question 8

In an experiment to determine the acceleration of free fall using a falling body, what would lead to a value that is too large?

A air resistance

B dimensions of the body are too large

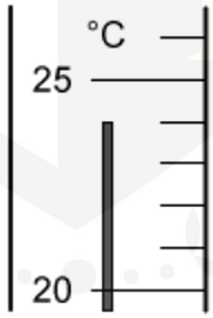
C measured distance longer than true distance

D measured time longer than true-time

[1 mark]

Question 9

The diagram shows part of a thermometer.



What is the correct reading on the thermometer and the uncertainty in this reading?

	reading/°C	uncertainty in reading/°C
A	24	±1
B	24	±0.1
C	24.0	±0.2
D	24.0	±0.5

[1 mark]

Question 10

The density of the material of a coil of thin wire is to be found.

Which set of instruments could be used to do this most accurately?

A metre rule, protractor, spring balance

B micrometer, metre rule, top-pan balance

C stopwatch, newton-meter, vernier calipers

D tape measure, vernier calipers, lever balance

[1 mark]