

Measurement

Question Paper 1

Level	IGCSE
Subject	Chemistry (0620/0971)
Exam Board	Cambridge International Examinations (CIE)
Topic	Experimental techniques
Sub-Topic	Measurement
Booklet	Question Paper 1

Time Allowed: 27 minutes

Score: /22

Percentage: /100

Grade Boundaries:

9	8	7	6	5	4	3	2	1
>85%	75%	68%	60%	53%	48%	40%	33%	<25%

- 1 A student takes 2 g samples of calcium carbonate and adds them to 20 cm³ samples of dilute hydrochloric acid at different temperatures. She measures how long it takes for the effervescence to stop.

Which apparatus does she use?

	balance	clock	filter funnel	measuring cylinder	thermometer
A	✓	✓	✓	✓	✗
B	✓	✓	✗	✓	✓
C	✓	✗	✓	✓	✓
D	✗	✓	✓	✗	✓

- 2 A student carries out an experiment to find how fast 3 cm pieces of magnesium ribbon dissolve in 10 cm³ samples of sulfuric acid at different temperatures.

Which piece of apparatus does the student **not** need?

- A** balance
 - B** measuring cylinder
 - C** stop-clock
 - D** thermometer
- 3 A student was provided with only a thermometer, a stopwatch and a beaker.

What could the student measure?

- A** 10.5 g solid and 24.8 cm³ liquid
- B** 10.5 g solid and 25 °C
- C** 24.8 cm³ liquid and 45 seconds
- D** 25 °C and 45 seconds

- 4 Part of the instructions in an experiment reads as follows.

Quickly add 50 cm^3 of acid.

What is the best piece of apparatus to use?

- A a burette
 - B a conical flask
 - C a measuring cylinder
 - D a pipette
- 5 A student investigates how the concentration of an acid affects the speed of reaction with a 0.5 g mass of magnesium at 30°C .

The student has a beaker, concentrated acid, water and the apparatus below.

- P a balance
- Q a clock
- R a measuring cylinder
- S a thermometer

Which pieces of apparatus does the student use?

- A P, Q and R only
 - B P, Q and S only
 - C Q, R and S only
 - D P, Q, R and S
- 6 A student measures the rate of two reactions.

In one reaction, there is a change in mass of the reactants during the reaction.

In the second reaction, there is a change in temperature during the reaction.

Which piece of apparatus would be essential in **both** experiments?

- A balance
- B clock
- C pipette
- D thermometer

7 Crystals of sodium chloride were prepared by the following method.

- 1 25.0 cm³ of dilute hydrochloric acid was accurately measured into a conical flask.
- 2 Aqueous sodium hydroxide was added until the solution was neutral. The volume of sodium hydroxide added was measured.
- 3 The solution was evaporated and the crystals washed with approximately 15 cm³ of water.

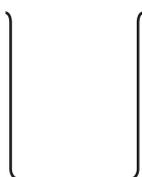
Which row shows the pieces of apparatus used to measure the 25.0 cm³ of hydrochloric acid, the volume of aqueous sodium hydroxide and the 15 cm³ of water?

	25.0 cm ³ of hydrochloric acid accurately	the volume of aqueous sodium hydroxide added	15 cm ³ of water approximately
A	burette	pipette	measuring cylinder
B	measuring cylinder	burette	pipette
C	pipette	burette	measuring cylinder
D	pipette	measuring cylinder	burette

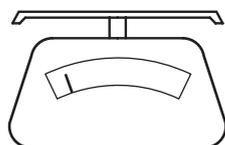
8 Lead iodide is insoluble in water.

Lead iodide is made by adding aqueous lead nitrate to aqueous potassium iodide.

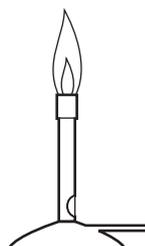
Which pieces of apparatus are needed to obtain solid lead iodide from 20 cm³ of aqueous lead nitrate?



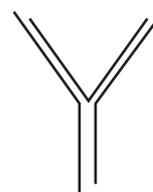
1



2



3



4



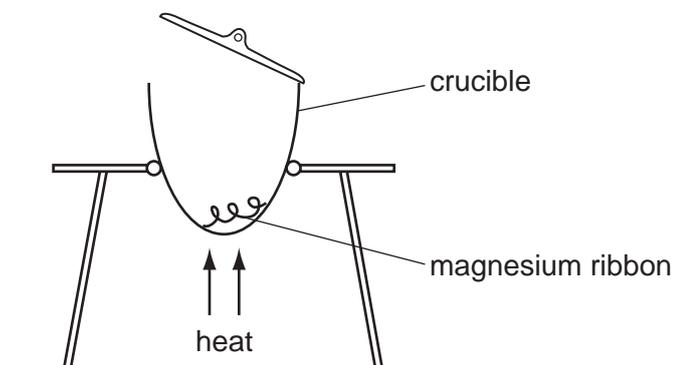
A 1, 2 and 4

B 1, 3 and 5

C 1, 4 and 5

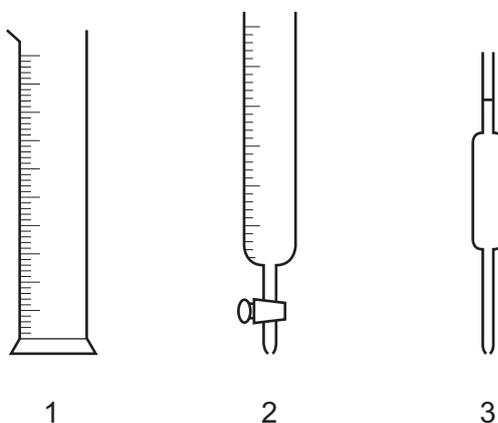
D 2, 4 and 5

- 9 The diagram shows an experiment to find the formula of magnesium oxide.



Which piece of apparatus would be needed in addition to those shown?

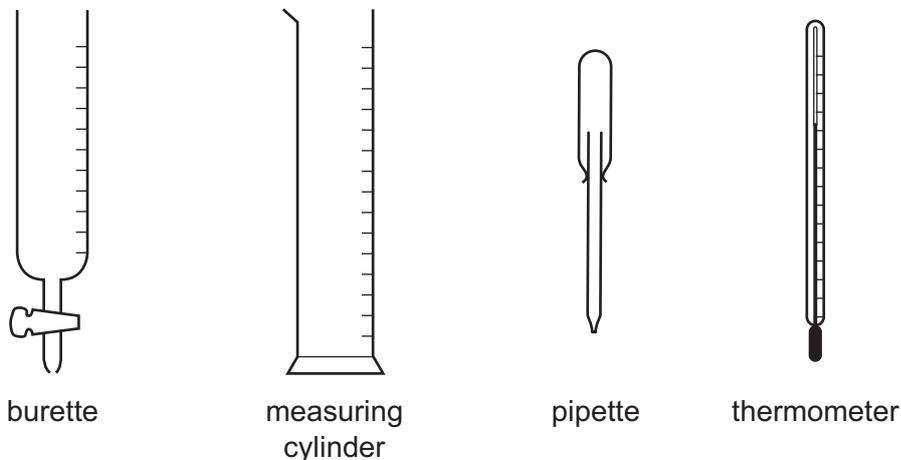
- A a balance
 - B a measuring cylinder
 - C a spatula
 - D a thermometer
- 10 The diagram shows three pieces of apparatus that are used for measuring the volume of a liquid.



What are these pieces of apparatus?

	1	2	3
A	burette	measuring cylinder	pipette
B	burette	pipette	measuring cylinder
C	measuring cylinder	burette	pipette
D	measuring cylinder	pipette	burette

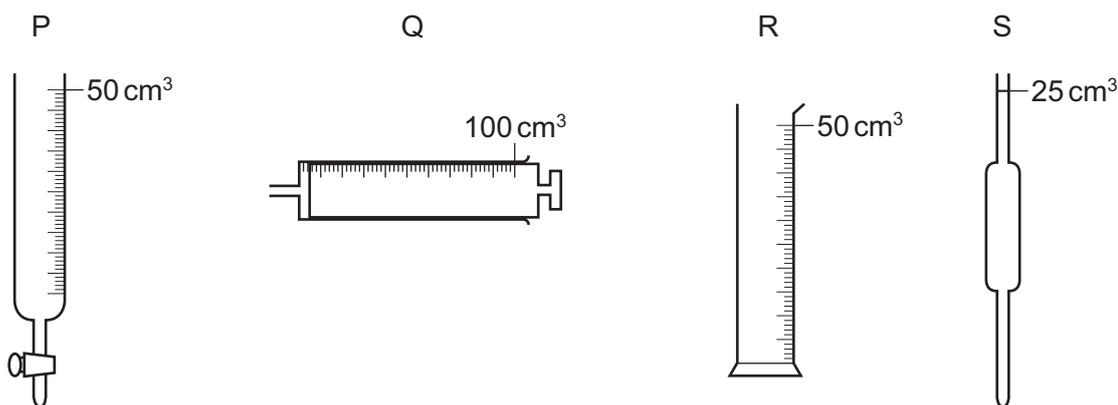
11 The four pieces of apparatus shown below are used in chemical experiments.



Which statement about the apparatus is correct?

- A** The burette measures the volume of liquid added in a titration.
- B** The measuring cylinder measures the mass of a substance used in an experiment.
- C** The pipette measures the volume of gas given off in a reaction.
- D** The thermometer measures the density of a solution.

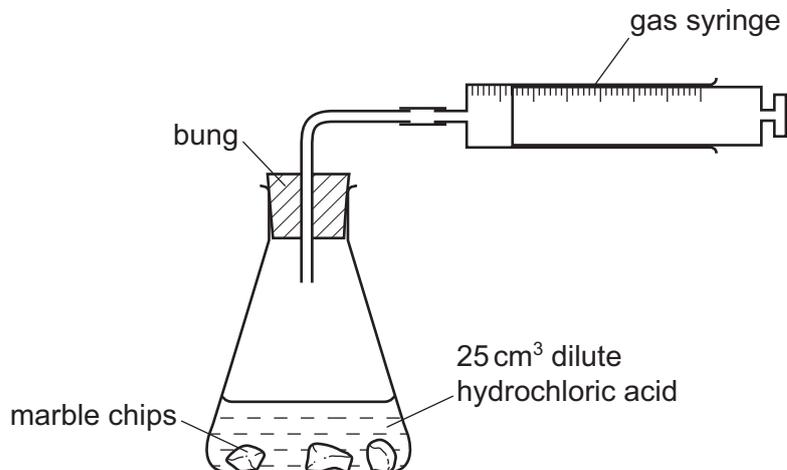
12 P, Q, R and S are pieces of apparatus.



Which row describes the correct apparatus for the measurement made?

	apparatus	measurement made
A	P	the volume of acid added to alkali in a titration
B	Q	cm ³ of acid to add to calcium carbonate in a rate-determining experiment
C	R	7 cm ³ of a gas given off in a rate-determining experiment
D	S	2 cm ³ of alkali for use in a titration

- 13 A student uses the apparatus shown in the diagram below to measure the volume of carbon dioxide gas made when different masses of marble chips are added to 25 cm³ of dilute hydrochloric acid.



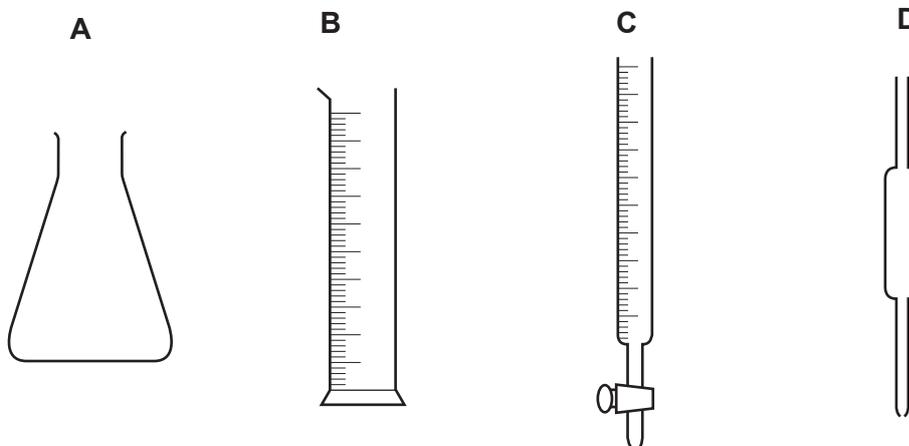
- Which other items of apparatus are needed?
- A** funnel and balance
B funnel and stopwatch
C measuring cylinder and balance
D measuring cylinder and stopwatch
- 14 During a reaction, the following changes take place.

- 1 The temperature rises.
- 2 A gas is given off.

Which apparatus is required to measure the rate of this reaction?

- A** balance and burette
B balance and gas syringe
C gas syringe and burette
D gas syringe and stopclock

15 Which piece of apparatus is used to measure variable quantities of liquid in a titration?



16 A student put 25.0 cm^3 of dilute hydrochloric acid into a conical flask.

The student added 2.5g of solid sodium carbonate and measured the change in temperature of the mixture.

Which apparatus does the student need to use to obtain the most accurate results?

- A balance, measuring cylinder, thermometer
- B balance, pipette, stopwatch
- C balance, pipette, thermometer
- D burette, pipette, thermometer

17 During an experiment a measurement is recorded in cm^3 .

Which apparatus is used?

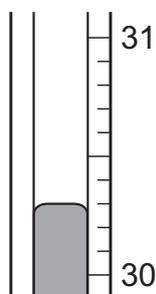
- A balance
- B measuring cylinder
- C stopclock
- D thermometer

18 25 cm³ of an alkali are added to 20 cm³ of an acid. The temperature change is measured.

Which apparatus is **not** needed in the experiment?

- A 25 cm³ measuring cylinder
- B 100 cm³ beaker
- C balance
- D thermometer

19 The diagram shows part of a thermometer.



What is the reading on the thermometer?

- A 30.2 B 30.3 C 31.7 D 31.8

20 A student needs to measure four different volumes of a solution accurately. The volumes are 10 cm³, 25 cm³, 50 cm³ and 60 cm³.

The apparatus available includes a 25 cm³ pipette.

Which volumes could be measured using this pipette?

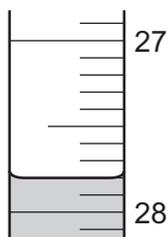
- A 10 cm³ and 25 cm³
- B 25 cm³ and 50 cm³
- C 25 cm³ only
- D 50 cm³ and 60 cm³

21 A student needs to measure 22 cm^3 of water at 40°C .

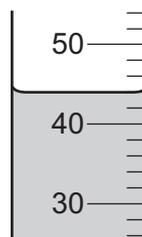
Which apparatus is required?

- A beaker and stopwatch
- B beaker and thermometer
- C measuring cylinder and stopwatch
- D measuring cylinder and thermometer

22 The diagrams show liquids in a burette and a measuring cylinder.



burette



measuring cylinder

Which row shows the correct readings for the burette and the measuring cylinder?

	burette	measuring cylinder
A	27.8	42
B	27.8	44
C	28.2	42
D	28.2	44