07 Practical Chemistry and Qualitative Analysis

Set A Concept Practice

Name	Time 35 minutes	Total 30 marks	Score ____ / 30

A From the lesson

23 MARKS

1 Which apparatus measures exactly 25.0 cm^3 of acid most accurately?

A measuring cylinder **B** pipette **C** beaker **D** gas syringe

/1

Answer [1]

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2 Which burette reading is recorded correctly?

A 23 cm^3 **B** 23.4 cm^3 **C** 23.45 cm^3 **D** 23.453 cm^3

/1

Answer [1]

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3 Which cation gives a white precipitate with both aqueous sodium hydroxide and aqueous ammonia, soluble in excess of both?

A Al^{3+} **B** Ca^{2+} **C** Zn^{2+} **D** Mg^{2+}

/1

Answer [1]

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4 A student adds dilute hydrochloric acid to a solution, then aqueous silver nitrate, and sees a white precipitate. Why does this not prove that the solution contained chloride ions?

A Silver nitrate does not react with chloride ions.

B The hydrochloric acid itself added chloride ions.

C Silver chloride is soluble in acid.

D The precipitate should be yellow.

/1

Answer [1]

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5 Repeated titres agree closely but are all larger than the true value. Which change would make them more accurate?

A Repeat the titration more times.

B Read the burette with the eye level with the meniscus.

C Use a larger conical flask.

D Average all the titres.

/1

Answer [1]

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6 **(a)** Give one advantage of a burette over a measuring cylinder.

.....

[1]

(b) Give one disadvantage of a pipette.

.....

[1]

/2

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7 **(a)** Gas X is less dense than air and insoluble in water. Suggest a method to collect it.

.....

[1]

(b) Gas Y reacts with acids. Name a drying agent for it and explain your choice.

.....

.....

[1]

/2

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8 **(a)** Why is the conical flask swirled during a titration?

.....

[1]

(b) A burette reads 1.20 cm^3 at the start and 24.65 cm^3 at the end-point. Find the titre.

.....

[1]

/2

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9 **(a)** Compound X contains aluminium, calcium or zinc ions. Describe how you would find out which.

.....

.....

.....

[2]

(b) A solution gives a light blue precipitate with aqueous ammonia that dissolves in excess. Give the colour of the final solution and the cation.

.....

[1]

/3

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10 **(a)** Describe the test for sulfate ions.

.....

..... [1]

(b) A solution contains sodium chloride or sodium iodide. How would you tell which?

.....

..... [1]

(c) How would you tell a sulfite from a sulfate?

.....

..... [1]

/3

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11 **(a)** A reaction gives off a colourless, odourless gas. Which gases could it be, and how would you tell them apart?

.....

.....

..... [2]

(b) Describe how to tell chlorine, ammonia and hydrogen apart.

.....

.....

..... [2]

/4

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12 **(a)** Which has the larger percentage uncertainty: 20.0 cm^3 in a measuring cylinder (±0.5 cm^3) or 2.00 g on a balance (±0.01 g)?

[1]

(b) Five readings of a 5.00 g mass are 5.21 g, 5.20 g, 5.22 g, 5.21 g and 5.20 g. Are they accurate, precise, both or neither?

..... [1]

/2

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B Practice

7 MARKS

13 Which apparatus is most suitable to measure 27.8 cm^3 of a solution?

A burette **B** beaker **C** pipette **D** measuring cylinder

/1

Answer [1]

Source: 2024 BLSS O Prelim P1 Q3

14 A student measures the time taken for 1.0 g of magnesium to dissolve in 25.0 cm^3 of dilute hydrochloric acid. A stopwatch and electronic balance are provided in the set-up.

What additional apparatus is essential to complete the experiment?

1 measuring cylinder
2 pipette
3 gas syringe

A 1 only **B** 2 only **C** 1 and 2 **D** 1 and 3

/1

Answer [1]

Source: 2024 Bukit View O Prelim P1 Q1

15 A student carried out an experiment involving the reaction between calcium carbonate and dilute hydrochloric acid. Based on the experimental results, a graph of volume of gas produced against time was plotted. Which apparatus were used by the student to make the necessary measurements?

A burette, pipette and stopwatch

B electronic balance and gas syringe

C gas syringe and stopwatch

D pipette and stopwatch

/1

Answer [1]

Source: 2024 SMSS O Sec3 P1 Q1

16 Two methods of gas collection are upward delivery and displacement of water. Which row correctly shows whether each of these methods could be used to collect the gas?

A denser than air and soluble: upward delivery yes, displacement of water yes

B less dense than air and soluble: upward delivery yes, displacement of water no

C denser than air and insoluble: upward delivery yes, displacement of water no

D less dense than air and insoluble: upward delivery no, displacement of water yes

/1

Answer [1]

Source: 2025 Compassvale O Prelim P1 Q1

17 Which row shows the correct drying agent and the corresponding gas that can be collected by upward delivery into a gas jar? Each option gives the drying agent, then the gas collected.

A anhydrous calcium oxide, carbon dioxide

B anhydrous calcium oxide, ammonia

C concentrated sulfuric acid, sulfur dioxide

D concentrated sulfuric acid, chlorine

/1

Answer [1]

Source: 2024 Woodlands O Prelim P1 Q1

18 Aqueous sodium hydroxide is neutralised by dilute hydrochloric acid in a titration. 25.0 cm^3 of aqueous sodium hydroxide is measured into a conical flask using a ...1... and a few drops of methyl orange are added. The dilute hydrochloric acid is added using a ...2.... The end-point is reached when the methyl orange turns ...3.... Which words complete blanks 1, 2 and 3?

	1	2	3
A	burette	pipette	red
B	burette	pipette	orange
C	pipette	burette	orange
D	pipette	burette	red

A row A **B** row B **C** row C **D** row D

/1

Answer [1]

2024 Zhenghua O Prelim P1-P3 Q1

19 When testing for chloride ions with silver nitrate, the solution must be acidified with dilute nitric acid. What is the purpose of the nitric acid?

A to act as a catalyst

B to oxidise the chloride ion

C to prevent precipitation of silver carbonate

D to prevent the decomposition of any silver chloride formed

/1

Answer [1]

2024 BLSS O Prelim P1 Q21