Candidate Name	Class	Register Number

CHANGKAT CHANGI SECONDARY SCHOOL

Preliminary Examination 2019

Subject : **Science (Chemistry)**
Paper No : **5078/01**
5076/01
Level : **Secondary 4 Express/**
Secondary 5 Normal Academic
Date : **04 September 2019**
Duration : **1 hour**
Setter : **Ms Marie Lee**

INSTRUCTIONS TO CANDIDATES
Do not open this booklet until you are told to do so.
Write your name, class and register number in the spaces at the top of this page.

MULTIPLE CHOICE QUESTIONS [40 MARKS]
Answer all questions. For each question, there are four possible answers A, B, C and D. Choose **one** correct answer and shade the correct answer in soft pencil on the OTAS provided.

A copy of the Periodic Table can be found on page 9.

For Examiners' Use	Marks
Paper 1	/ 40
Personal Target	Actual Grade
Parent's / Guardian's signature	

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This Question Paper consists of **9** printed pages.

MULTIPLE CHOICE QUESTIONS (40 marks)

1 A student measures 2.0 g of calcium carbonate and adds it to 20 cm^3 of dilute hydrochloric acid at different temperatures. He measures the time taken for the reaction to stop.

Which of the following apparatus is needed for the experiment?

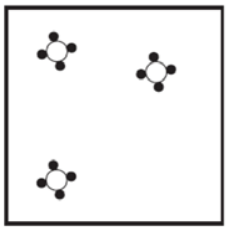
	electronic balance	stopwatch	filter funnel	measuring cylinder	thermometer
A	√	√	√	√	×
B	√	√	×	√	√
C	√	×	√	√	√
D	×	√	√	×	√

2 Which changes occur when a liquid at 50°C becomes a gas at 120°C?

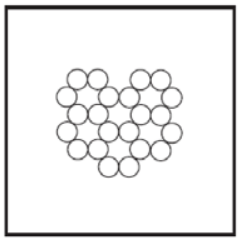
	attractive forces between particles	**separation of particles**	**energy of particles**
A	decrease	decreases	increases
B	decreases	increases	increases
C	increases	decreases	decreases
D	increases	increases	decreases

3 Which diagram represents the arrangement of particles in a gas?

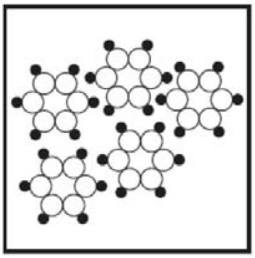
A



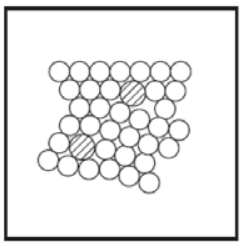
B



C



D

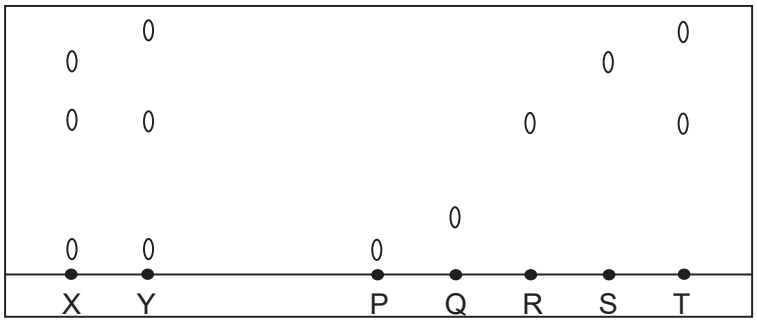


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4 A beaker contains a mixture of ethanol and water. Which method could be used to separate the mixture of ethanol and water and the corresponding purity check for the separated ethanol?

	method of separation	**purity check**
A	filtration	observe the colour and scent
B	fractional distillation	observe the colour and scent
C	fractional distillation	measure the boiling point
D	simple distillation	measure the boiling point

5 The diagram shows the result of a chromatogram obtained from two mixtures, X and Y.



Which of the substance(s) is/are present in mixture X but not in mixture Y?

A Q and S only
B R and T only
C S only
D T only

6 Which statement(s) about isotopes of the same element is/are correct?

I They are atoms which have the same chemical properties because they have the same number of electrons in their outer shell.

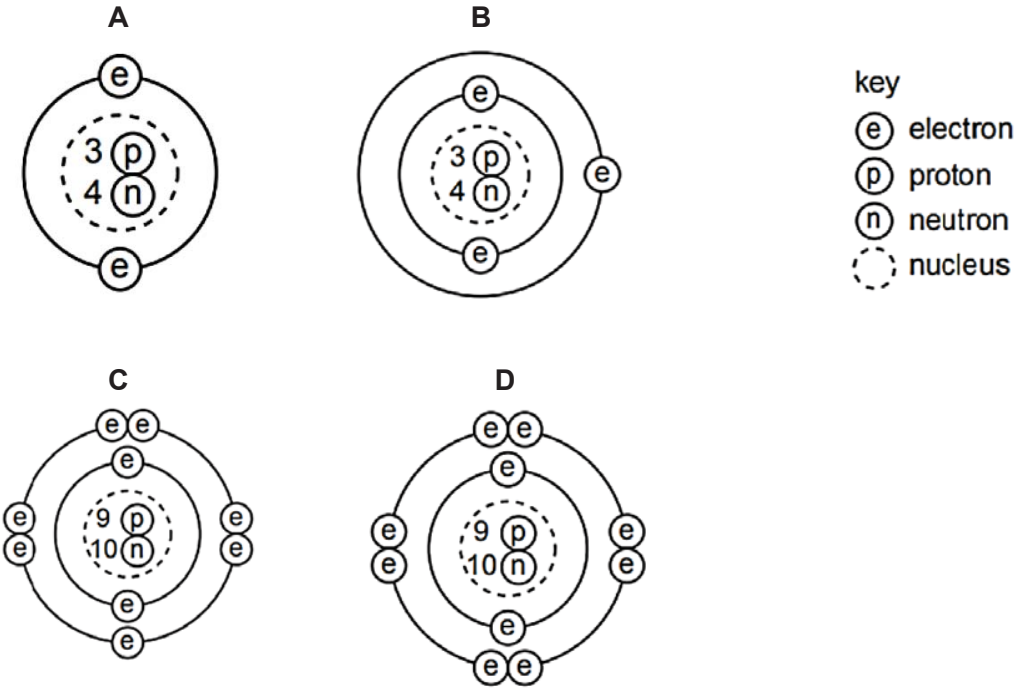
II They are atoms which have the same number of electrons and neutrons but different number of protons.

III They are atoms which have the same number of electrons and protons but different number of neutrons.

A I and II
B I and III
C II only
D III only

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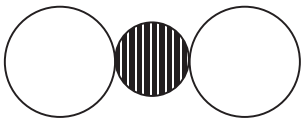
7 Which diagram shows a positively-charged ion?



8 When substance X and substance Y are heated together, substance Z is produced.
The chemical equation of the reaction is as follows:

$$X + Y \rightarrow 2Z$$

A molecule of Z has the following structure:



Which of the following statements is true about X, Y and Z?

A X can be either an element or compound.
B Z is a mixture of X and Y.
C Z is an ionic compound with chemical formula X_2Y_2.
D Z has similar chemical properties as compared to X and Y.

9 When sodium is added to water, a gas is produced.
Which of the following is true when potassium is added to water instead?

A No gas is produced.
B The reaction is slower.
C More energy is given out.
D A smaller volume of gas is produced compared to gas produced for sodium.

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10 When copper (II) nitrate is heated, it decomposes to form copper (II) oxide, nitrogen dioxide gas and oxygen gas. The chemical equation of the decomposition of copper (II) nitrate is as follows:

$$2Cu(NO_3)_2\ (s) \rightarrow 2CuO(s) + 4NO_2(g) + O_2(g)$$

What is the mass of copper (II) nitrate that has decomposed if 4.0g of copper (II) oxide is produced?

A 12.6 g
B 9.4 g
C 18.8 g
D 6.3 g

11 Many countries have taken measures to ensure that the amount of sulfur in unleaded petrol and diesel fuels are kept low.

Which of the following could be the reason for such measures?

A To reduce the amount of fuel used in motor vehicles.
B To increase the acidity of the rain.
C To reduce incomplete combustion.
D To prevent the pH of soil from decreasing.

12 Fresh distilled water has a pH value of 7.0. However after it was left standing in the open for a short time, the pH was observed to drop below 7.0.

Which of the following ions caused the drop in pH value?

A ammonium ion, NH_4^+
B chloride ion, Cl^-
C hydrogen ion, H^+
D hydroxide ion, OH^-

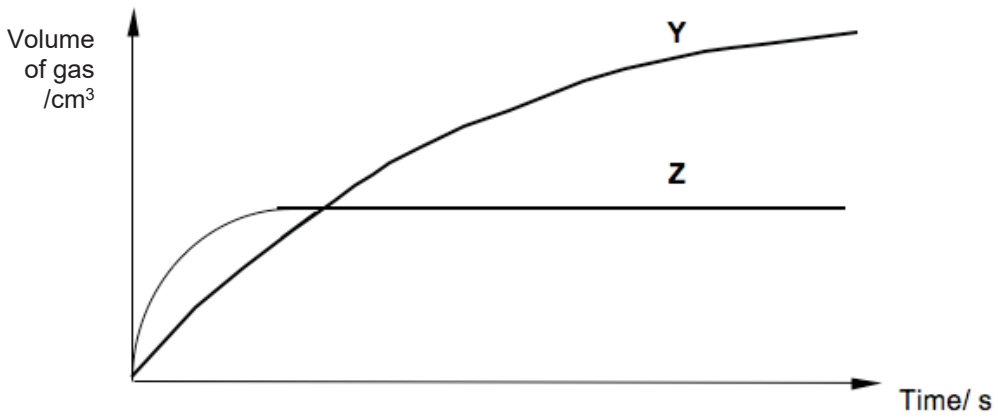
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13 Lead (II) carbonate reacts with both nitric acid and sulfuric acid. In what ways are the two reactions the same?

I Water is formed.
II A gas is produced.
III A white precipitate is obtained.

A II only
B II and III
C I and II
D I, II and III

14 Excess calcium carbonate was added into 100 cm^3 of 1.0 mol/dm^3 of hydrochloric acid. The curve **Y** represents the results obtained when the volume of gas collected was plotted against time.



The experiment was repeated using different volumes and concentrations of hydrochloric acid. Which change could produce curve **Z**?

A 50 cm^3 of 1.0 mol/dm^3 hydrochloric acid
B 25 cm^3 of 1.0 mol/dm^3 hydrochloric acid
C 50 cm^3 of 2.0 mol/dm^3 hydrochloric acid
D 25 cm^3 of 2.0 mol/dm^3 hydrochloric acid

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15

Experiment	X	Y	Z
Does the metal liberate hydrogen from dilute hydrochloric acid?	yes	no	yes
Is the metal oxide reduced by heating with carbon?	yes	yes	no

	most reactive →		least reactive
A	X	Z	Y
B	Y	X	Z
C	Z	X	Y
D	Z	Y	X

16 The chart below shows four iron plates under different conditions.

plate 1
Exposed to moisture only, wrapped with a copper foil

plate 2
Exposed to air and moisture, kept in a beaker with a drying agent.

plate 3
Exposed to air and moisture beside a solution of sodium chloride.

plate 4
Exposed to moisture, kept in an air-tight jar.

Which of these plates will corrode the fastest?

A plate 1
B plate 2
C plate 3
D plate 4

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17 The table below shows information about the exhaust fumes produced from car engines that run on petrol and diesel respectively.

Type of engine	Concentration of carbon monoxide present	Concentration of nitrogen oxides present	Concentration of sulfur dioxide present
petrol engine	high	low	low
diesel engine	low	high	high

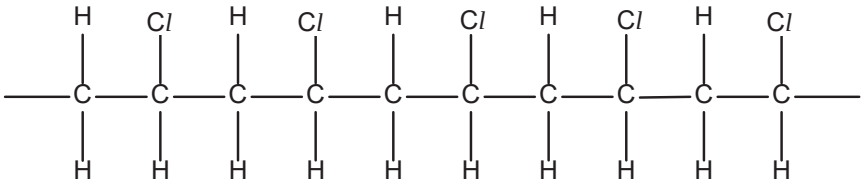
Which statement can be inferred using the data in the table?

A Burning petrol contributes less towards the formation of acid rain.
B Burning petrol generates more heat in the combustion engine.
C Cars running on diesel produce fumes that are less sooty.
D Cars running on diesel do not contribute to air pollution.

18 Which of the processes is different from the others in terms of energy changes?

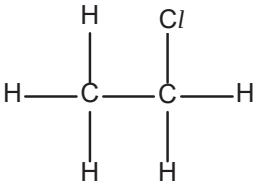
A forming of bonds
B combustion
C neutralisation
D photosynthesis

19 The diagram shows the structure of a polymer.

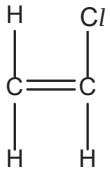


Which monomer is used to manufacture the polymer?

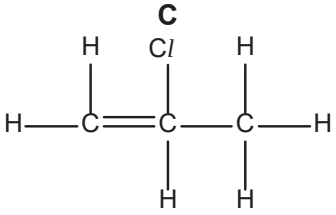
A



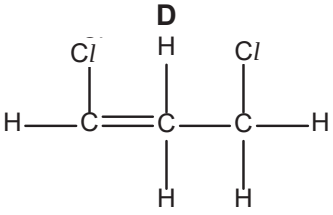
B



C



D



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20 Which of the following is true of the oxidation of ethanol?

A Carbon dioxide is produced.
B It can also be used in the detection of alcohol content in drivers.
C There is a decrease in the oxidation states of the elements in ethanol.
D The product has the functional group –C=O.

--End of Paper-

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The Periodic Table of Elements

Group I	Group II											Group III	Group IV	Group V	Group VI	Group VII	Group 0
							1 H hydrogen 1										2 He helium 4
3 Li lithium 7	4 Be beryllium 9											5 B boron 11	6 C carbon 12	7 N nitrogen 14	8 O oxygen 16	9 F fluorine 19	10 Ne neon 20
11 Na sodium 23	12 Mg magnesium 24											13 Al aluminium 27	14 Si silicon 28	15 P phosphorus 31	16 S sulfur 32	17 Cl chlorine 35.5	18 Ar argon 40
19 K potassium 39	20 Ca calcium 40	21 Sc scandium 45	22 Ti titanium 48	23 V vanadium 51	24 Cr chromium 52	25 Mn manganese 55	26 Fe iron 56	27 Co cobalt 59	28 Ni nickel 59	29 Cu copper 64	30 Zn zinc 65	31 Ga gallium 70	32 Ge germanium 73	33 As arsenic 75	34 Se selenium 79	35 Br bromine 80	36 Kr krypton 84
37 Rb rubidium 85	38 Sr strontium 88	39 Y yttrium 89	40 Zr zirconium 91	41 Nb niobium 93	42 Mo molybdenum 96	43 Tc technetium -	44 Ru ruthenium 101	45 Rh rhodium 103	46 Pd palladium 106	47 Ag silver 108	48 Cd cadmium 112	49 In indium 115	50 Sn tin 119	51 Sb antimony 122	52 Te tellurium 128	53 I iodine 127	54 Xe xenon 131
55 Cs caesium 133	56 Ba barium 137	57 – 71 lanthanoids	72 Hf hafnium 178	73 Ta tantalum 181	74 W tungsten 184	75 Re rhenium 186	76 Os osmium 190	77 Ir iridium 192	78 Pt platinum 195	79 Au gold 197	80 Hg mercury 201	81 Tl thallium 204	82 Pb lead 207	83 Bi bismuth 209	84 Po polonium –	85 At astatine –	86 Rn radon –
87 Fr francium –	88 Ra radium –	89 – 103 actinoids	104 Rf Rutherfordium –	105 Db dubnium –	106 Sg seaborgium –	107 Bh bohrium –	108 Hs hassium –	109 Mt meitnerium –	110 Ds darmstadtium –	111 Rg roentgenium –	112 Cn copernicium –		114 Fl flerovium –		116 Lv livermorium –		

Key

proton (atomic) number
atomic symbol
name
relative atomic mass

lanthanoids	57 La lanthanum 139	58 Ce cerium 140	59 Pr praseodymium 141	60 Nd neodymium 144	61 Pm promethium –	62 Sm samarium 150	63 Eu europium 152	64 Gd gadolinium 157	65 Tb terbium 159	66 Dy dysprosium 163	67 Ho holmium 165	68 Er erbium 167	69 Tm thulium 169	70 Yb ytterbium 173	71 Lu lutetium 175
actinoids	89 Ac actinium –	90 Th thorium 232	91 Pa protactinium 231	92 U uranium 238	93 Np neptunium –	94 Pu plutonium –	95 Am americium –	96 Cm curium –	97 Bk berkelium –	98 Cf californium –	99 Es einsteinium –	100 Fm fermium –	101 Md mendelevium –	102 No nobelium –	103 Lr lawrencium –

The volume of one mole of any gas is 24 dm^3 at room temperature and pressure (r.t.p.).

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Candidate Name	Class	Register Number

CHANGKAT CHANGI SECONDARY SCHOOL

Preliminary Examination 2019

Subject : Science (Chemistry)
Paper No : 5076/03, 5078/03
Level : Secondary 4 Express/ 5 Normal Academic
Date : 30 August 2019
Duration : 1 hour 15 mins
Setter : Ms Marie Lee

INSTRUCTIONS TO CANDIDATES
Do not open this booklet until you are told to do so.
Write your name, class and register number in the spaces at the top of this page.

Section A [45 MARKS]
Answer **all** questions. Write your answers in the spaces provided on the question paper.

Section B [20 MARKS]
Answer any **two** questions. Write your answers in the spaces provided on the question paper.

A copy of the Periodic Table can be found on page 12.

For Examiners' Use	Marks
Section A	/ 45
Section B	
	/ 10
	/ 10
Total	/ 65
Personal Target	Actual Grade
Parent's / Guardian's signature	

This Question Paper consists of **12** printed pages.

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Section A [45 marks]
Answer all the questions in this section in the spaces provided.

1 **Table 1.1** shows some information about six particles.

Table 1.1

Particle	Number of protons in particle	Number of neutrons in particle	Number of electrons in particle
A	37	48	37
B	53	74	54
C	92	143	92
D	92	143	89
E	92	146	92
F	94	150	92

(a) What is the nucleon number for particle A?

…… [1]

(b) Explain why particle B is a negative ion.

……

…… [1]

(c) Which two atoms are isotopes of the same element?

…… [1]

2 Magnesium reacts with sulfur to form the compound, magnesium sulfide.

(a) Suggest two physical properties of magnesium sulfide.

……

…… [2]

(b) Explain, in terms of electrons, how a magnesium atom reacts with a sulfur atom to make a magnesium ion and a sulfide ion.

……

……

……

…… [2]

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3 When solutions are mixed, precipitates are sometimes formed.

(a) Barium carbonate is an insoluble compound. It is formed as a precipitate when solutions of barium chloride and sodium carbonate are mixed.

When solutions of potassium chloride and sodium sulfate are mixed, no precipitate is formed.

Complete **Table 3.1** to show the colour and name of the precipitates formed from mixing solutions of some compounds, if any.

Table 3.1

	sodium carbonate solution	**sodium sulfate solution**
Barium chloride solution	white precipitate of barium carbonate	
Calcium chloride solution		white precipitate of calcium sulfate
Potassium chloride solution		no precipitate

[3]

(b) When solutions of lead (II) nitrate and potassium bromide are mixed, a precipitate of lead(II) bromide and a solution of potassium nitrate are produced.

The equation for the reaction is

…….Pb $(NO_3)_2$ (……) + …….KBr (……) → …….$PbBr_2$ (……) +…..KNO_3 (……) [2]

Complete the equation with the correct numbers and state symbols.

(c) In order to prepare a pure, dry sample of lead (II) bromide, a student carried out the following steps:

Steps:

- The mixture was filtered,
- The residue was washed with distilled water, and
- The solid was left in a warm place for several hours.

(i) Explain why the student filtered the mixture.

……

…… [1]

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(ii) Explain why the student washed the residue.

……

…… [1]

4 A sample of 25.0 cm^3 of 0.500 mol/dm^3 of aqueous ammonium nitrite, NH_4NO_2, is heated and nitrogen gas is produced as shown below.

$$NH_4NO_2(aq) \rightarrow N_2(g) + 2H_2O(l)$$

(a) Describe how you could show that aqueous ammonium nitrite contains ammonium ions.

……

……

…… [2]

(b) **(i)** Calculate the number of moles of ammonium nitrite in 25.0 cm^3 of 0.500 mol/dm^3 in its aqueous solution.

…… moles [1]

(ii) A sample of 25.0 cm^3 of 0.500 mol/dm^3 aqueous ammonium nitrite is heated and nitrogen gas is produced accordingly to the chemical equation given above. Calculate the volume of nitrogen gas formed, measured at room temperature and pressure.

volume of nitrogen gas = …… [2]

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(iii) Calculate the relative molecular mass of ammonium nitrite and hence calculate the concentration of 0.500 mol/ dm^3 ammonium nitrite solution in g/ dm^3.

Relative molecular mass of ammonium nitrite is …… [1]

Concentration of ammonium nitrite is …….. g/ dm^3 [1]

(c) **(i)** State two chemicals that can be used to produce aqueous ammonium nitrite.

……..….

……..…. [1]

(ii) State the preparation method that can be used to produce ammonium nitrite salt.

……..…. [1]

(d) **(i)** Ammonium nitrate, NH_4NO_3, decomposes when heated, in a similar way to ammonium nitrite, with water as one of the two products. Write a balanced chemical equation for this reaction.

……..…. [1]

(ii) Describe a chemical test for nitrate ion and state the results with ammonium nitrate.

chemical test

……..….

……..…. [1]

results with ammonium nitrate

……..….

……..…. [1]

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5 Fluorine, chlorine, bromine and iodine are halogens in Group VII of the Periodic Table.

(a) With reference to the atomic structure, explain why fluorine, chlorine, bromine and iodine are in Group VII of the Periodic Table.

……

…… [1]

(b) With reference to the atomic structure, describe and explain the trend in the reactivity of the elements in Group VII as it goes down the group.

……

……

……

…… [3]

6 **Fig 6.1** shows a sequence of reactions involving elements from Group VII.

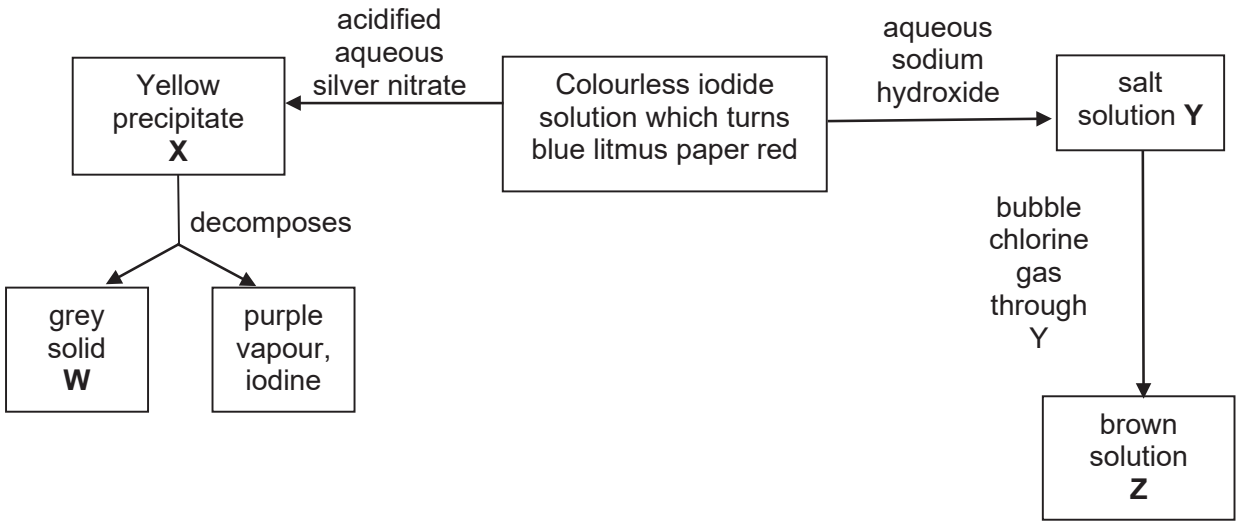


Fig 6.1

(a) Identify the following:

W ……..

X ……..

Y ……..

Z …….. [4]

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(b) Write a chemical equation, including state symbols, for the reaction between salt solution **Y** and chlorine gas.

…… [2]

7 Haematite, a common ore used for the extraction of iron, contains the compound, iron(III) oxide. Iron is produced in the blast furnace by heating a mixture of iron(III) oxide, coke and limestone with air. **Fig. 7.1** gives the outline of a blast furnace in which iron is extracted from its ore.

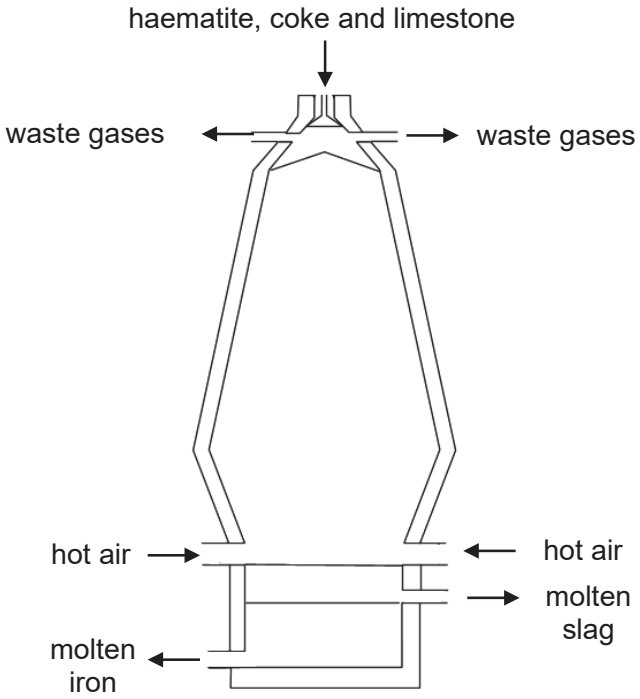


Fig 7.1

(a) Describe how carbon dioxide is produced under high heat in the blast furnace.

……..

…….. [2]

(b) The chemical equation for the production of iron in the blast furnace is shown.

$$Fe_2O_3\ (s)\ +\ 3CO\ (g)\ \rightarrow\ 2Fe\ (l)\ +\ 3CO_2\ (g)$$

(i) State the oxidation state of iron in Fe_2O_3.

…… [1]

[Turn over

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(ii) Explain, in terms of oxidation state, whether iron (III) oxide is oxidised or reduced.

……

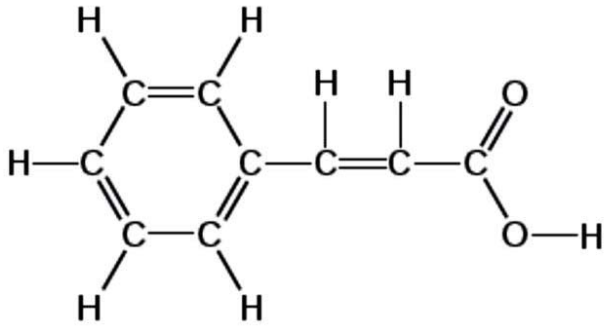
…… [2]

(c) State a reason for the presence of nitrogen gas in the blast furnace.

……

…… [1]

8 Cinnamic acid is found in plants called balsams.
The structure of cinnamic acid is shown below.



(a) Cinnamic acid is an unsaturated compound.

What is meant by the term “unsaturated”?

……

…… [1]

(b) Describe a chemical test to show that cinnamic acid is unsaturated.

chemical test

……

…… [1]

result with cinnamic acid

……

…… [1]

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Section B [20 marks]
Answer any **two** questions in this section.
Write your answers in the spaces provided.

9 **(a)** Aqueous iron (II) sulfate can react with magnesium metal but not copper.

(i) Explain why copper is unable to react with aqueous iron (II) sulfate.

……

……

…… [2]

(ii) Write the ionic equation for the reaction between aqueous iron (II) sulfate and magnesium.

…… [1]

(iii) Explain two observations that can be made when magnesium reacts with aqueous iron (II) sulfate.

……

……

…… [2]

(b) When acidified potassium manganate (VII) was added to aqueous iron (II) sulfate, aqueous iron (III) sulfate was formed.

State the observation for this reaction.

…… [1]

(c) Describe how a student can confirm the presence of iron (II) and sulfate ions in the solution.

iron (II) ion: ……

……

sulfate ion: ……

…… [2]

(d) Comment on the electrical conductivity of aqueous iron (II) sulfate, giving a reason for your answer.

……

…… [2]

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10 **(a)** Air is a mixture of gases which consists of nitrogen, oxygen, carbon dioxide and a small percentage of argon, water vapour and other gases.

(i) Classify the gases in air by writing the chemical formula of any two elements and two compounds in Table 10.1 below.

Table 10.1

chemical formulae of two elements found in air	chemical formulae of two compounds found in air

[2]

(ii) Describe two differences between elements and compounds.

……

……

…… [2]

(iii) In another similar experiment, the total volume of air in the apparatus before heating is 150 cm^3. At the end of the experiment, the volume of gas remaining is 125 cm^3.

Use this information to calculate the percentage of oxygen in this sample of air.

[2]

(b) Other than clear air, the atmosphere also contains a large number of pollutants including sulfur dioxide, oxides of nitrogen, methane and chlorofluorocarbons (CFCs). Carbon dioxide, methane and CFCs are greenhouse gases.

(i) Explain one effect of an increase in the atmospheric concentration of carbon monoxide.

……

…… [2]

(ii) Other than the production of carbon monoxide gas in the blast furnace, state one source of this gas and explain why it is produced.

……

…… [2]

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11 Alcohols form a homologous series.

(a) State two general properties of a homologous series.

……

……

…… [2]

(b) X is an alcohol containing two carbon atoms in its molecule.

(i) Complete **Table 11.1** by naming, drawing the full structural formula and stating the chemical formula of X.

Table 11.1

Name of X	Structural formula of X	Chemical formula of X

[3]

(ii) State the chemical equation for the reaction between X and atmospheric oxygen.

…… [1]

(iii) A solution of X can be made by fermentation of glucose. Describe how this process is completed in the laboratory, using appropriate apparatus.

……

……

……

…… [3]

(iv) X is commonly used in Brazil as a fuel for vehicles. Suggest a reason why X can be used for this purpose.

……

…… [1]

--End of Paper--

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CCSS: 2019 Sec 4 and 5 Preliminary Examinations 2019

Paper 1

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
B	B	A	C	C	B	A	A	C	B
Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
D	C	C	D	C	C	A	D	B	B

Paper 3

Section A

1	(a)	85	[1]
	(b)	Particle B is in Group VII which is a non-metal, which takes in one electron to form negative ions with noble gas structure.	[1]
	(c)	C and E	[1]
2	(a)	Magnesium sulfide has a high melting and boiling point/ able to conduct electricity in molten and aqueous state/ soluble in water, insoluble in organic solvents. (Any of the 2 above)	[2]
	(b)	Magnesium atom will give out two electrons to form a positive magnesium ion. [1] Sulfur atom will take in two electrons to form a negative sulfide ion to obtain a noble gas structure. [1]	[2]

3						
			sodium carbonate solution	sodium sulfate solution		
		Barium chloride solution	white precipitate of barium carbonate	**white precipitate of barium sulfate**		
		Calcium chloride solution	**white precipitate of calcium carbonate**	white precipitate of calcium sulfate		
		Potassium chloride solution	**No precipitate**	No preciptate		[3]

	(b)	1 $Pb(NO_3)_2$ (aq) + 2 KBr (aq) → $PbBr_2$ (s) + 2KNO_3 (aq)	[2]
		[1] For balanced chemical equation	
		[1] For correct state symbols	
	(c)	(i) To remove potassium nitrate solution from lead (II) bromide.	[1]
		(ii) To wash away any potassium nitrate or impurities that may still remain on lead(II) bromide.	[1]
4	(a)	Add sodium hydroxide and warm. If the gas produced turns moist red litmus blue, ammonia gas is produced. Therefore, ammonium ions are present in ammonium nitrite.	[2]

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	(b)	(i)	25/1000 x 0.500 = 0.0125 moles	[1]
	(b)	(ii)	NH_4NO_2 (aq) → N_2 (g) + $2H_2O$ (l)	[1]
			1 mole 1 mole	
			1 mol = 24 dm^3 0.0125 mol x dm^3	[1]
			x = 0.3 dm^3	
			Volume of nitrogen = 0.300 dm^3 (3 sf) (No units, no marks)	
	(b)	(iii)	Relative molecular mass of NH_4NO_2	
			= 14 + 4 + 14 + 32 = 64	[1]
			Concentration = 64 x 0.500 = 32g/ dm^3	[1]
			*Working must be shown for the marks to be awarded.	
	(c)	(i)	Ammonium hydroxide and nitric acid	[1]
		(ii)	Titration method	[1]
	(d)	(i)	NH_4NO_3 → N_2O + $2H_2O$	[1]
		(ii)	Add sodium hydroxide, aluminium foil to the solution. Warm gently.	
			Warm gently. [1]	
			If gas produced turns moist red litmus paper blue, ammonia gas is	
			produced. Nitrate ion is present. [1]	[2]
5	(a)		They have seven valence electrons.	[1]
	(b)		As the elements goes down the group, the reactivity of the elements	
			decreases. [1]	
			As the elements goes down the group, the atomic size of the element	
			becomes bigger. [1]	
			Therefore, there is less tendency for the nucleus to gain or attract	
			electrons to form negative ions. [1]	[3]
6	(a)	W:	Silver, Ag	
		X:	Silver iodide, AgI	
		Y:	Sodium iodide, NaI	
		Z:	Iodine, I_2	[4]
	(b)	2 NaI (aq) + Cl_2(g) → 2 NaCl(aq) + I_2 (aq)		[2]
		[1]: Balanced chemical equations		
		[1]: Correct state symbols		
7	(a)	Carbon dioxide is formed when coke is burnt in hot air [1]		
		and when limestone is decomposed at high temperature. [1]		[2]
		Fe_2O_3 + 3CO → 2Fe + $3CO_2$		
	(b)	(i)	+3	[1]
		(ii)	The oxidation state of iron has decreased and thus, it is reduced. [1]	
			The oxidation state of iron has decreased from +3 in iron (III) oxide to	

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			0 in iron. [1]	[2]
	(c)	Hot air contains 78% of nitrogen gas which remains unreacted in the blast		
		furnace when all the oxygen is reacted with coke.		[1]
8	(a)	The compound contains carbon carbon double bond.		[1]
	(b)	Bubble the compound through reddish-brown bromine solution. [1]		
		Reddish brown bromine solution is decolourised. [1]		[2]

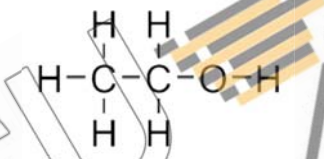
Section B

9	(a)	(i)	Copper is less reactive than iron and loses electrons less readily. [1]	
			Therefore, copper is unable to react and displace iron from aqueous iron(II)	
			sulfate. [1]	[2]
		(ii)	$Mg(s) + Fe^{2+}(aq) \rightarrow Mg^{2+}(aq) + Fe(s)$	[1]
		(iii)	Green solution fades and might turn colourless. [1]	
			Grey solid deposits formed. [1]	
			Magnesium dissolves and becomes smaller in size. [1]	
			(Any two)	[2]
	(b)	Purple acidified potassium manganate(VII) solution turns colourless / decolourises.		[1]
	(c)	Add aqueous sodium hydroxide to the solution.		
		Green precipitate formed if Fe^{2+} ions are present. [1]		
		Add dilute nitric acid, followed by aqueous barium nitrate to the solution		
		White precipitate formed if SO_4^{2-} ions are present. [1]		[2]
	(d)	Aqueous iron(II) sulfate can conduct electricity [1]		
		due to the presence of free mobile ions (Fe^{2+} and SO_4^{2-}) to carry		
		charges.[1]		[2]
10	(a)	(i)	Chemical formula of two elements found in air: N_2, O_2, Ar, Ne (Any two) / Chemical fomula of two compounds found in air: CO_2, H_2O	[2]
		(ii)	A compound is made up of two or more different elements chemically	
			combined but an element is made up of only one type of atoms.	[1]
			A compound can only be broken down into simpler type of matter	
			by chemical means but elements cannot be broken down into	
			simpler matter by physical or chemical means	[1]
		(iii)	150-125 =25cm^3 [1]	
			(25/150)x 100=16.7% [1]	[2]

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	(b)	(i)	Carbon monoxide will bind more strongly with haemoglobin [1] than	
			oxygen preventing the oxygen from being absorb to the body which	
			causes death. [1]	[2]
		(ii)	In the car engine when the fuel undergoes incomplete	
			combustion [1] because of insufficient supply of oxygen, [1]	
			carbon monoxide is produced.	[2]
11	(a)	(i)	Members of the same homologous series have similar chemical	
			properties [1]	
			The members display a gradual change in their physical	
			properties as the number of carbon atoms increases in their	
			molecules. [1]	[2]
		(ii)	$C_nH_{2n+1}OH$	[1]
	(b)	(i)		

Name of X	Structural formula of X	Chemical formula of X
ethanol		C_2H_5OH

[2]

		(ii)	CH_3CH_2OH (*l*) + 2[O] → CH_3COOH (aq) + H_2O (*l*)	[1]
		(iii)	Yeast is added to a solution of glucose in a conical flask. [1]	
			Temperature of the mixture is kept at 37°C [1]	
			The conical flask is connected through a delivery tube to a test tube	
			with limewater to prevent oxygen in air from entering the conical	
			flask.[1]	[3]
		(iv)	X can be burnt exothermically to produce heat to power the vehicles.	[1]

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