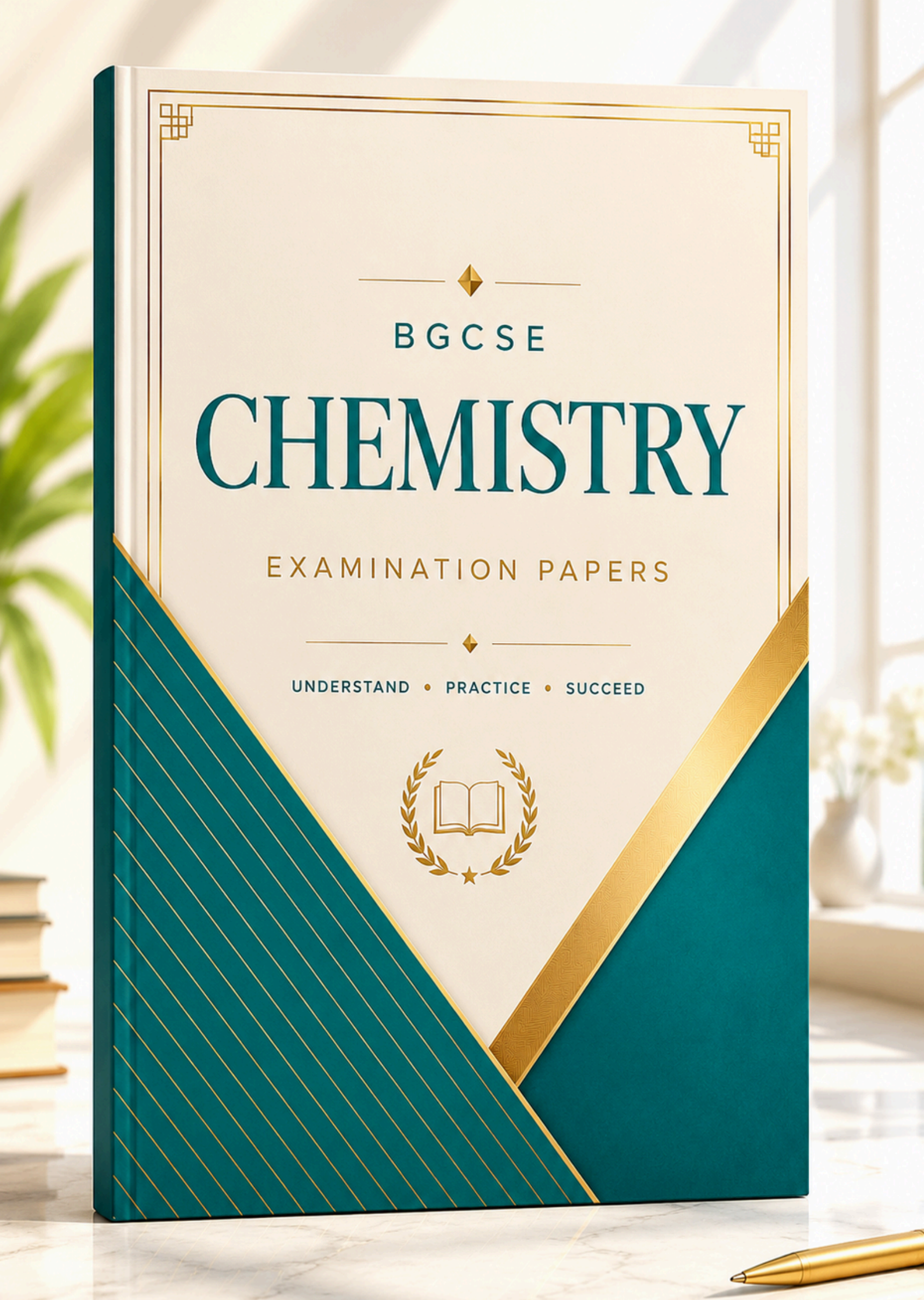

BGCSE
CHEMISTRY
EXAMINATION PAPERS
UNDERSTAND • PRACTICE • SUCCEED

THE OPENHANDED CLASSROOM

LEARN MORE. ACHIEVE MORE. SMILE MORE.

BGCSE CLASSES

- Exam-Focused Learning
- Past Papers & Strategies
- Stronger Understanding
- Better Grades, Brighter Future

CLICK HERE

SAT CLASSES

- Smart Test Strategies
- Stronger Scores
- Time Management Skills
- College & Scholarship Ready

CLICK HERE

BJC CLASSES

- Clear, Simple Explanations
- Focus on Understanding
- Help That Fits Your Pace
- Build Confidence, Get Results

CLICK HERE

EXPERT TEACHING. PROVEN RESULTS.

LEARN SMARTER. ACHIEVE MORE.

FOCUSED SUPPORT. REAL RESULTS.

THEOPENHANDEDCLASSROOM:
(242) 426-8891

EXAM-REAL. EXAM-PROVEN.

FREE LISTENING COMPREHENSION AUDIO FILES

THE EXACT AUDIO USED IN PAST BJC & BGCSE EXAMS

REAL EXAMS
The exact listening comprehension audio from past papers.

REAL PREPARATION
Hear what you'll hear in the real exam.

REAL RESULTS
Practise with purpose. Improve your confidence and performance.

AVAILABLE FOR:

- BJC ENGLISH
- BGCSE ENGLISH LANGUAGE
- BJC FRENCH
- BJC SPANISH
- BGCSE FRENCH
- BGCSE SPANISH

WHY THESE AUDIO FILES MATTER

EXACT AUDIO
The exact recordings used in past BJC & BGCSE exams.

EXAM FAMILIARITY
Get used to the real voices, speed, accents and exam conditions.

STRATEGIC ADVANTAGE
Walk in confident knowing exactly what to expect.

100% FREE
High quality. No cost. Just results.

CLICK HERE

DOWNLOAD • START PRACTISING

BETTER PREPARATION.
BETTER RESULTS.
You've got this!

PAST EXAMS. REAL AUDIO. BETTER PREP. GREATER CONFIDENCE.

3051/2 **BGCSE**

School Number	Candidate Number
Surname and Initials	

CHEMISTRY

PAPER 2

Thursday **10 JUNE 2021** **1:30 P.M.–3:00 P.M.**

Additional materials:
Calculator

MINISTRY OF EDUCATION
NATIONAL EXAMINATIONS

BAHAMAS GENERAL CERTIFICATE OF SECONDARY EDUCATION

INSTRUCTIONS AND INFORMATION TO CANDIDATES

Do not open this booklet until you are told to do so.

Write your school number, candidate number, surname and initials in the spaces provided above.

Answer **ALL** the questions on this paper.

Read each question carefully and make sure you know what you have been asked to do before starting your answer.

The instruction **NAME** . . . requires an answer in words **NOT** chemical symbols.

Show **ALL** your working when answering numerical questions. Lines are provided on the question paper for your answers. You should write your answers on these lines only.

A copy of the Periodic Table is provided on page 2.

The mark for each part question is given in brackets [ ].

FOR EXAMINER'S USE	
1	
2	
3	
4	
5	
6	
7	
8	
TOTAL	

This question paper consists of 15 printed pages and 1 blank page.

The Periodic Table of the Elements

Group																	
I	II										III	IV	V	VI	VII	0
							1 H Hydrogen 1									4 He Helium 2
7 Li Lithium 3	9 Be Beryllium 4										11 B Boron 5	12 C Carbon 6	14 N Nitrogen 7	16 O Oxygen 8	19 F Fluorine 9	20 Ne Neon 10
23 Na Sodium 11	24 Mg Magnesium 12										27 Al Aluminium 13	28 Si Silicon 14	31 P Phosphorus 15	32 S Sulphur 16	35.5 Cl Chlorine 17	40 Ar Argon 18
39 K Potassium 19	40 Ca Calcium 20	45 Sc Scandium 21	48 Ti Titanium 22	51 V Vanadium 23	52 Cr Chromium 24	55 Mn Manganese 25	56 Fe Iron 26	59 Co Cobalt 27	59 Ni Nickel 28	64 Cu Copper 29	65 Zn Zinc 30	70 Ga Gallium 31	73 Ge Germanium 32	75 As Arsenic 33	79 Se Selenium 34	80 Br Bromine 35	84 Kr Krypton 36
85 Rb Rubidium 37	88 Sr Strontium 38	89 Y Yttrium 39	91 Zr Zirconium 40	93 Nb Niobium 41	96 Mo Molybdenum 42	Tc Technetium 43	101 Ru Ruthenium 44	103 Rh Rhodium 45	106 Pd Palladium 46	108 Ag Silver 47	112 Cd Cadmium 48	115 In Indium 49	119 Sn Tin 50	122 Sb Antimony 51	128 Te Tellurium 52	127 I Iodine 53	131 Xe Xenon 54
133 Cs Caesium 55	137 Ba Barium 56	139 La Lanthanum 57 *	178 Hf Hafnium 72	181 Ta Tantalum 73	184 W Tungsten 74	186 Re Rhenium 75	190 Os Osmium 76	192 Ir Iridium 77	195 Pt Platinum 78	197 Au Gold 79	201 Hg Mercury 80	204 Tl Thallium 81	207 Pb Lead 82	209 Bi Bismuth 83	Po Polonium 84	At Astatine 85	Rn Radon 86
Fr Francium 87	226 Ra Radium 88	227 Ac Actinium 89 †															

140 Ce Cerium 58	141 Pr Praseodymium 59	144 Nd Neodymium 60	Pm Promethium 61	150 Sm Samarium 62	152 Eu Europium 63	157 Gd Gadolinium 64	159 Tb Terbium 65	162 Dy Dysprosium 66	165 Ho Holmium 67	167 Er Erbium 68	169 Tm Thulium 69	173 Yb Ytterbium 70	175 Lu Lutetium 71
232 Th Thorium 90	Pa Protactinium 91	238 U Uranium 92	Np Neptunium 93	Pu Plutonium 94	Am Americium 95	Cm Curium 96	Bk Berkelium 97	Cf Californium 98	Es Einsteinium 99	Fm Fermium 100	Md Mendelevium 101	No Nobelium 102	Lr Lawrencium 103

*58-71 Lanthanoid series
†90-103 Actinoid series

Key

a
X
b

a = relative atomic mass
X = atomic symbol
b = proton (atomic) number

1. A sample of muddy water was collected by students. The mud was removed from the mixture by filtration.

(a) (i) Draw a fully labelled diagram to show the filtration of the muddy water.

[3]

(ii) After the mud is removed from the water, name the physical technique that would be used to remove dissolved salts and collect the water.

_____ [1]

(iii) Describe a test and the results to determine the purity of the water collected in (a)(ii).

Test: _____

Results: _____ [2]

(b) A student adds copper (II) sulfate to water in a beaker to form a saturated solution.

(i) What is observed in the beaker when the copper (II) sulfate solution is saturated?

_____ [1]

(ii) Describe a test that can be used to show that the solution contains a sulfate ion.

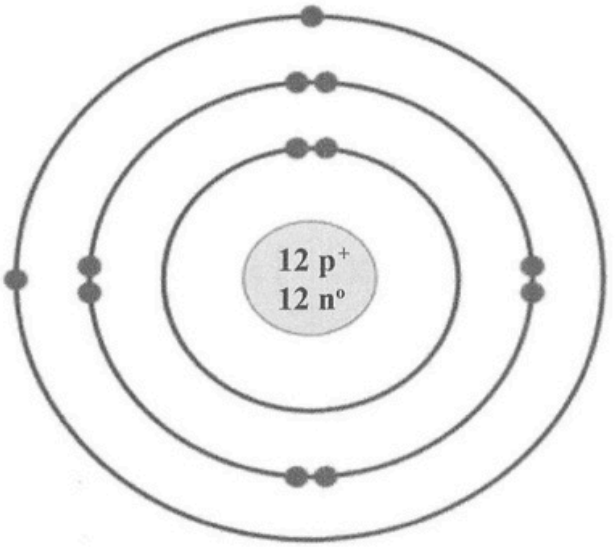
_____

_____

_____ [3]

TOTAL MARKS [10]

2. The diagram shows an atom of magnesium.



(a) (i) Magnesium is a metal

State **two** properties of metals.

_____

_____ [2]

(ii) State the type of bonding that occurs when magnesium chloride is formed.

_____ [1]

(iii) Using Lewis Dot diagrams draw the bonding diagram for magnesium chloride.

Use outer electrons only.

[3]

(b) Magnesium exists as three isotopes in nature; magnesium-24, occurring 79%, magnesium-25, occurring 10% and magnesium-26 occurring 11%.

(i) Use the information given to calculate the relative atomic mass of magnesium to four significant figures.

[2]

(ii) Complete the following table by inserting the number of subatomic particles found in magnesium-26

Magnesium-26 particle	Number
electrons	
neutrons	
protons	

[2]

TOTAL MARKS [10]

3. Use the equation to answer the following questions:

$$H_2SO_4(aq) + Ca(OH)_2(aq) \longrightarrow CaSO_4(aq) + 2H_2O(l)$$

(a) Name the type of chemical reaction occurring in the equation.

_____ [1]

(b) Universal indicator is placed in a conical flask with the sulfuric acid before the other reactant was added.

(i) State the colour of the universal indicator at the beginning and at the end of the reaction.

Colour at the beginning of the reaction: _____

Colour at the end of the reaction: _____ [2]

(ii) Name the process by which sulfuric acid is produced.

_____ [1]

(iii) State **one** commercial use of sulfuric acid.

_____ [1]

(iv) State why universal indicator is not used in a titration experiment.

_____ [1]

(c) A student prepares a sample of barium sulfate by reacting barium chloride with sodium sulfate.

Describe a method to produce a pure dry sample of barium sulfate.

_____

_____

_____

_____

_____ [4]

TOTAL MARKS [10]

4. Chemists need to know if a reaction releases energy or absorbs energy.

(a) State which of these are exothermic and endothermic.

(i) condensation of a gas to a liquid _____

(ii) burning of fuel for cooking _____

(iii) necessity of sunlight during photosynthesis in a leaf _____ [3]

(b) The spacecraft fuel, dimethylhydrazine, has a large energy content **per gram** of fuel.

This is shown in the table.

energy per mole of fuel in kJ/mol	−1694
molar mass of fuel	60
energy per gram of fuel in kJ/g	−1694 ÷ 60 = −28.2

Calculate which fuel, methanol or octane, produces the most energy per gram of fuel.

Methanol, CH_3OH, energy per mole of fuel = −726 kJ/mol
Octane, C_8H_{18}, energy per mole of fuel = −5590 kJ/mol.

_____ [2]

(c) (i) Draw a labelled diagram to show electrolysis of potassium bromide solution.

[3]

(ii) State why electrolysis can occur in potassium bromide solution.

_____ [1]

(iii) Give **one** industrial use of electrolysis.

_____ [1]

[TOTAL MARKS 10]

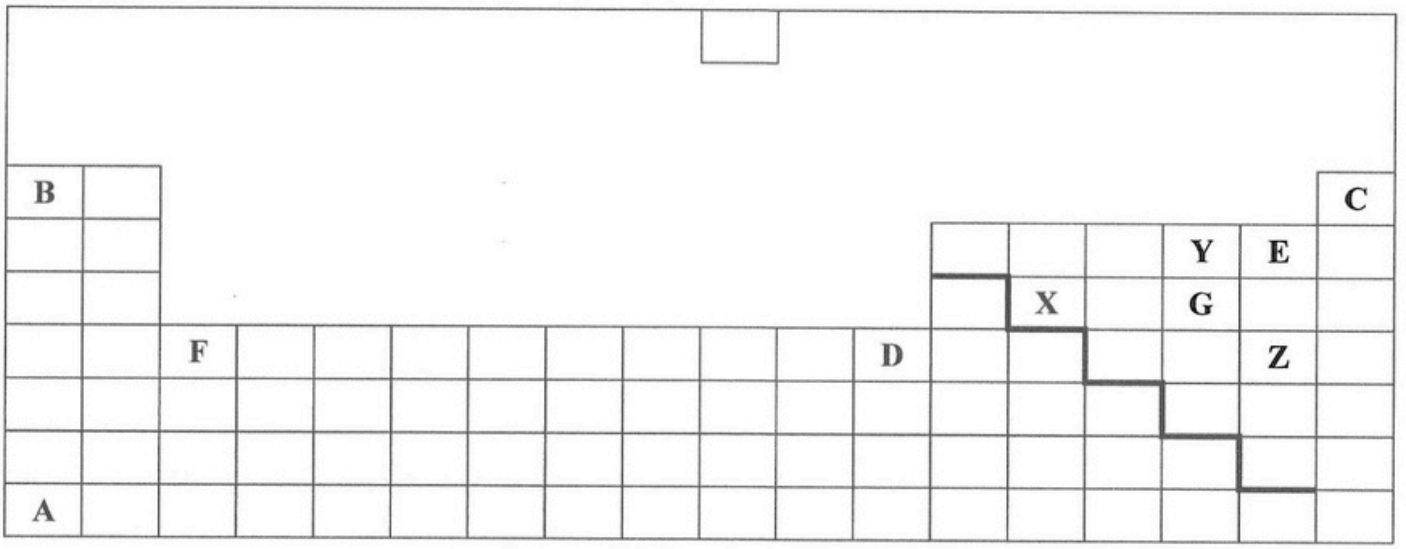
5. In 1869, a Russian chemist and teacher, Dmitri Mendeleev, published a table of elements.

(a) How did Mendeleev organise his Periodic Table?

_____ [1]

(b) A section of the modern Periodic Table is shown.

The letters that represent elements in the Periodic Table are **not symbols of elements.**



Use the letters in the section of the Periodic Table to answer the questions.

(i) Which letter represents the

most reactive metal? _____

most reactive non-metal? _____ [2]

(ii) Letter **D** in the Periodic Table represents an element with an atomic number of 29.

What is the number of neutrons in this element?

_____ [1]

(iii) Use the letters **B** and **Y** to write the formula of a compound formed by their reaction.

_____ [1]

(iv) Why would the elements represented by **E** and **Z** have similar chemical properties?

_____ [1]

(v) Which letter represents an element that is a liquid at room temperature?

_____ [1]

(vi) Write the electronic configuration for the ion of the element represented by the letter **G**.

_____ [1]

(c) Draw a diagram to show the bonding in an oxygen molecule, O_2.

Use outer electrons only.

[2]

[TOTAL MARKS 10]

6. The table contains a list of chemicals. Use this list to answer **(a)** to **(h)**.

aluminium oxide	hydrogen
oxygen	sulfuric acid
carbon	ammonia
iron	nitrogen
chlorine	sodium oxide

(a) Identify **two** chemicals needed to make ammonia.

_____

_____ [2]

(b) Which chemical is an amphoteric oxide?

_____ [1]

(c) Name **two** chemicals used to make chloromethane; CH_3Cl.

_____

_____ [2]

(d) Name the lightest gas.

_____ [1]

(e) Name the solid that reacts with water to form an alkali.

_____ [1]

(f) Name the alkaline gas.

_____ [1]

(g) Name the catalyst used in the Haber Process.

_____ [1]

(h) Name the substance that makes up 20% of the atmosphere.

_____ [1]

[TOTAL MARKS 10]

7. Organic Chemistry is an important branch of Chemistry.

(a) Which element is primarily a part of Organic Chemistry?

_____ [1]

(b) Alkanes and alkenes are two homologous series.

(i) Explain what is meant by the term 'homologous series'.

_____

_____ [2]

(ii) Draw the structure of an alkane with three carbons.

[1]

(iii) Draw the structure of an alkene with three carbons.

[1]

(c) (i) Name the type of reaction that occurs when an alkane reacts with bromine.

_____ [1]

(ii) Many alkene molecules join together to make a polymer.

State the name of the smaller unit that forms a polymer.

_____ [1]

(d) Homemade wine can be made by putting yeast into grape juice.

(i) Name this process.

_____ [1]

(ii) Explain the job of the yeast in this process.

_____

_____

_____

_____ [2]

[TOTAL MARKS 10]

8. The catalytic converter was invented for use in cars in the 1970s.

Gasoline in the 1970's contained a chemical which damaged the catalytic converter and also poisoned humans. This chemical has been banned from use in gasoline.

(a) Name this chemical.

_____ [1]

(b) Sulfur is a by-product of petroleum and natural gas processing.

(i) Name a gas formed when sulfur comes in contact with gases in the atmosphere.

_____ [1]

(ii) When this gas reacts with water it causes a phenomenon in nature. Name this phenomenon.

_____ [1]

(iii) State the effects of this phenomenon on stone work and metals.

Effect on stonework _____

Effect on metals _____ [2]

(c) Petroleum is a finite energy source.

(i) Define the term 'finite'. _____

_____ [2]

(ii) Give an example of an alternative energy source.

_____ [1]

(d) Sulfur dioxide is used as a preservative in foods today.

(i) Explain briefly why foods are preserved.

_____

_____ [1]

(ii) Identify another food preservative.

_____ [1]

[TOTAL MARKS 10]

End]

BLANK PAGE