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| C:\Users\s.kanakis\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\ACC Logo_L_rgb_lrg.jpg | **Aranmore Catholic College**  **Semester 1 Examination, 2015**  **Question/Answer Booklet** |

Please place your student identification label in this box

**Year 10 Science Level 2**

**Chemistry**

Student Name

#### Time allowed for this paper

Reading time before commencing work: 5 minutes

Working time for paper: 30 minutes

**Materials required/recommended for this paper**

To be provided by the supervisor

This Question/Answer Booklet

Separate Multiple Choice Answer Sheet

Data Sheet

***To be provided by the candidate***

Standard items: pens, pencils, eraser, correction fluid, ruler, highlighters.

Special items: non-programmable calculators satisfying the conditions set by the Curriculum Council for this course.

**Important note to candidates**

No other items may be taken into the examination room. It is **your** responsibility to ensure that you do not have any unauthorised notes or other items of a non‑personal nature in the examination room. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.

**Structure of this paper**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Section | Number of questions available | Number of questions to be answered | Suggested working time  (minutes) | Marks available | Percentage of exam |
| Section A:  Multiple Choice | 20 | 20 | 12 | 20 | 20 |
| Section B:  Short Answer | 8 | 8 | 18 | 30 | 30 |
|  | | | | 50 | 50 |

**Instructions to candidates**

1. The rules for the conduct of examinations at Aranmore are detailed in the ***Examination***

***Information Handbook 2015****.* Sitting this examination implies that you agree to abide by

these rules.

2. Part A: Circle or cross only one letter on the separate Multiple-Choice Answer Sheet. If you consider that two or more of the alternative answers are correct, choose the one you think is best. If you think you know an answer, mark it even if you are not certain you are correct. Marks will NOT be deducted for incorrect answers.

Part B: Write your answers in this Question/Answer Booklet in the spaces provided.

3. Working or reasoning should be clearly shown when calculating or estimating answers.

4. You must be careful to confine your responses to the specific questions asked and to follow

any instructions that are specific to a particular question.

5. Spare pages are included at the end of this booklet. They can be used for planning your

responses and/or as additional space if required to continue an answer.

• Planning: If you use the spare pages for planning, indicate this clearly at the top of the

page.

• Continuing an answer: If you need to use the space to continue an answer, indicate in

the original answer space where the answer is continued, i.e. give the page number.

Fill in the number of the question(s) that you are continuing to answer at the top of the

page.

6. The accompanying *Year 10 Data Sheet* may be used as required.

### Section A - CHEMISTRY (50% of total examination)

**Marks allotted: 20 marks out of 50 total (20%)**

Answer ***ALL*** questions in Part A on the separate Multiple Choice Answer Sheet.

**1.** Sodium has 11 electrons. When in its ground state, its electron configuration is:

A. 11

B. 2,8,1

C. 2,9

D. 10,1

**2.** An atom has an electron configuration of 2,8,8,1. What group would it be in?

A. 8

B. 4

C. 2

D. 1

**3.** Which of the following elements has 6 protons in its nucleus?

1. Boron
2. Magnesium
3. Carbon
4. Sulphur

**4.** Which of the following are all ***transition metals***?

* 1. Li, Mn, Ca
  2. Mn, Fe, Cu
  3. F, Cl, Br
  4. Na, K, Fe

**5.** Which of the following are all ***alkali metals***?

* 1. Li, Na, K
  2. Mg, Ca, Na
  3. He, Ne, Ar
  4. Cu, F, Mn

**6.** Which of the following all have ***2 valence electrons***?

* 1. F, Cl, Br
  2. Li, Na, Al
  3. Cl, Al, C
  4. Be, Ca, Mg

**7.** The ***valence electrons*** are:

* 1. the number of total electrons an atom has.
  2. the number of electrons an atom has after it reacts.
  3. the number of electrons an atom has before it reacts.
  4. the number of electrons in the atom's outer shell.

**8.** What are the elements in group seventeen of the periodic table called?

* 1. Transition metals
  2. Alkali metals
  3. Halogens
  4. Alkali earth metals

**9.** The mass number of an atom is the total:

* 1. charge on the nucleus of the atom.
  2. number of protons in the atom.
  3. mass of the atom expressed in grams.
  4. number of protons and neutrons in the atom.

**10.** Aluminium is in group 13. Use this information to determine the most likely charge of aluminium ions.

A. +3

B. -3

C. +5

D. -5

**11.** Nitrogen N is in period 2, group 15. Which of the following elements would have properties most similar to nitrogen?

A. phosphorus P (period 3, group 15)

B. oxygen O (period 2, group 16)

C. neon Ne (period 2, group 18)

D. sodium (Na) because its symbol also starts with N

The melting and boiling points of the group 1 elements are shown in the table below.

Use this table to answer the following 4 questions (Questions 12 - 15).

|  |  |  |
| --- | --- | --- |
| **Group 1** | **Melting point (°C)** | **Boiling point (°C)** |
| Li | 282 | 1342 |
| Na | 98 | ??? |
| K | ??? | 760 |
| Rb | 39 | 686 |

**12.** One **melting point** in the above table is missing. Which of the following temperatures is it most likely to be?

A 42°C

B 63°C

C 100°C

D 232°C

**13.** One **boiling point** in the table above is missing. Which of the following temperatures is it most likely to be?

A 700°C

B 750°C

C 883°C

D 1350°C

**14.** Use the information given in the table above to determine what state lithium (Li) will be in at a temperature of 300°C. Lithium (Li) will be a:

A solid

B liquid

C gas

D plasma

**15.** Use the information given in the table above to determine what state rubidium (Rb) will be in at room temperature (25°C):

A solid

B liquid

C gas

D plasma

**16.** Which **product** in the following chemical reaction is dissolved in solution?

CaCO3(s) + 2HCl(aq) → CaCl2(aq) + CO2(g) + H2O(l)

A. HCl

B. CaCl2

C. CO2

D. H2O

**17.** Which of the following equations is balanced?

A. C2H6 + O2 → CO2 + H2O

B. C2H6 + O2 → 2CO2 + 3H2O

C. C2H6 + 7O2 → 2CO2 + 3H2O

D. 2C2H6 + 7O2 → 4CO2 + 6H2O

18. Explain why adding a catalyst to a reaction increases the rate of reaction.

A. The catalyst can provide a pathway for the chemical reaction that requires less energy.

B. The catalyst can help the reactant molecules to come together and react.

C. The catalyst can force reactants into the correct arrangement so that they react.

D. All of the above answers are correct.

19. Explain why crushing solid reactants helps to increase the rate of reaction.

A. It exposes more of the solid reactant to the other reactants so there can be more reactions occurring at any one time.

B. It weakens the chemical bonds in the solid so that it is easier for the reaction to occur.

C. It helps the solid to dissolve.

D. All answers are correct.

**20.** The correct formula for Magnesium Nitrate is:

A. Mg(NO3)2

B. MgNO3

C. Mg(NO2)2

D. MgNO2

**END OF Section A**

**Section B: SHORT ANSWER: 30 marks - total (30%)**

Attempt ***ALL*** 8 short answer questions below. Answers are to be written in the spaces provided.

**1.** State the charge of: (4 marks)

a a proton

b a neutron

c an electron

e atom

**2.** Magnesium has an atomic number of 12. (4 marks)

a State how many protons would be in the nuclei of its atoms.

b State how many electrons would be in each of its atoms.

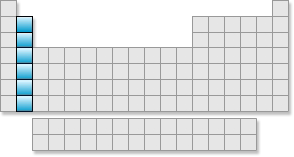
c State the electron configuration of its atoms when in their ground state.

d Predict the most likely charge of magnesium ions.

**3.** Fill in the table below for the following elements: (8 marks)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Element** | **Symbol** | **Atomic Number** | **Group** | **Electron Configuration** |
| Calcium |  |  |  |  |
| Lithium |  |  |  |  |
| Flourine |  |  |  |  |
| Argon |  |  |  |  |

**4.** Name the shaded sections on each of the following diagrams: (2 marks)



[](http://www.google.com.au/url?sa=i&rct=j&q=&esrc=s&frm=1&source=images&cd=&cad=rja&docid=Qm0hgTQr-Byu2M&tbnid=gnPjFGgJ-Zfx-M:&ved=0CAUQjRw&url=http://periodictable-mrstaylor.wikispaces.com/P8+-+Metalloids&ei=bcWJUeOaJs7OkwWO6IC4DQ&psig=AFQjCNHxhXcKb0NYWsq8gGVP-aP1_SVakA&ust=1368069838045648)

**5.** State the group numbers of the following element ‘families’: (3 marks)

a inert gases

b alkali metals

c halogens

**6.** Balance the equations below: (4 marks)

a P4 + O2 → P2O5(s)

c Al2(SO4)3(aq) + Ca(OH)2(aq) → Al(OH)3(s) + CaSO4(aq)

**7. N**ame these compounds: (2 marks)

a Al2(SO4)3

b MgCO3

8. List three ways in which the rate of a reaction may be increased. (3 marks)

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

**END OF CHEMISTRY SECTION**