AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX EXAMINATION

APRIL/ MAY 2018

Chemistry Paper II

Time: 2 hours 25 minutes Marks: 40

AKEB May 2018 Test for Teaching & Learning Only

INSTRUCTIONS

Please read the following instructions carefully.

1. Check your name and school information. Sign if it is accurate.

I agree that this is my name and school. **Candidate's signature**

2. RUBRIC. There are EIGHT questions. Answer ALL questions. Questions 7 & 8 each offer TWO choices. Attempt any ONE choice from each.

3. When answering the questions:

   Read each question carefully.
   Use a black pointer to write your answers. DO NOT write your answers in pencil.
   Use a black pencil for diagrams. DO NOT use coloured pencils.
   DO NOT use staples, paper clips, glue, correcting fluid or ink erasers.
   Complete your answer in the allocated space only. DO NOT write outside the answer box.

4. The marks for the questions are shown in brackets ( ).

5. You may use a simple calculator if you wish.

Q.1. (Total 4 Marks)

A student has incorrectly identified the branches of chemistry according to the descriptions given in his assignment.

Read the descriptions carefully and write the correct name of the branch of chemistry in the next column.

S. No.	Description	Incorrect Name of the Branch	Correct Name of the Branch
1.	A subfield of chemistry dealing with radioactivity. It includes the study of the production and use of radioactive sources for a range of processes.	Physical Chemistry	
2.	The study of chemical processes within and relating to living organisms.	Environmental Chemistry	
3.	It deals with the qualitative and quantitative determination of chemical components of substances.	Organic Chemistry	
4.	The branch of chemistry which applies physical and chemical processes for the transformation of raw materials into products on a large scale that are of benefit to humanity.	Nuclear Chemistry	

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Q.2. (Total 3 Marks)

An atom of an element **X** has atomic number 12 and mass number 24. It loses 2 electrons from its outer most shell and acquires a +2 charge.

Draw the atomic structure of the ion of element **X**.

Space for drawing

Q.3. (Total 5 Marks)

a. Define electronegativity. (1 Mark)

b. Describe with reasons,

i. the change in electronegativity across the period in the periodic table. (2 Marks)

ii. the trend in shielding effect when going down a group of the periodic table. (2 Marks)

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Q.4. (Total 5 Marks)

a. There are two similar tea bags. One is placed in a cup of hot water while the other is placed in a cup of cold water.

i. In which cup will the water turn brown more quickly? (1 Mark)

ii. Explain your answer to part **i** with reference to the movement of particles. (2 Marks)

b. A solution of copper (II) sulphate in water is saturated at 70°C. What will happen if the solution is cooled to 20°C? Give a suitable reason for your answer. (2 Marks)

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Q.5. (Total 4 Marks)

During an experiment, $MgBr_2$ and NaCl salts in their molten form are electrolysed in separate electrolytic cells.

Illustrate the reaction at anode and cathode in each electrolytic cell using balanced chemical equations.

a. $MgBr_2$ (2 Marks)

At the anode:

_____

_____

At the cathode:

_____

_____

b. NaCl (2 Marks)

At the anode:

_____

_____

At the cathode:

_____

_____

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Q.6. (Total 4 Marks)

Give reasons why:

a. Mercury is used in thermometers. (1 Mark)

_____

_____

b. Silver is used in making jewellery. (1 Mark)

_____

_____

c. Copper is used to make water pipes. (1 Mark)

_____

_____

d. Reaction mixture of sodium and water turns red litmus paper to blue. (1 Mark)

_____

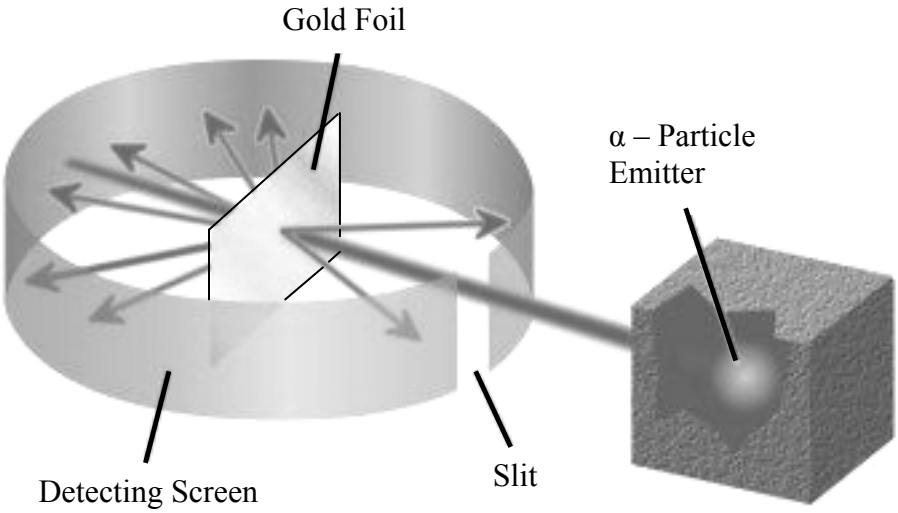
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Q.7. (Total 8 Marks)

EITHER

a. In 1911, a scientist proposed planetary model for an atom based on the given illustration of gold foil experiment.



i. Name the scientist who carried out the gold foil experiment. (1 Mark)

ii. Based on the given experiment, describe the FIVE main points of the planetary model of the atom as concluded by the scientist identified in part **i**. (5 Marks)

iii. Mention the TWO fundamental defects in the planetary model of the atom. (2 Marks)

OR

b.

i. Name and describe the types of bonds and their formation in the following species. (7 Marks)

I. A water molecule (H_2O)

II. A hydronium ion (H_3O^+)

ii. Mention ONE similarity between the bonds identified in part **i**. (1 Mark)

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Q.8. (Total 7 Marks)

EITHER

a.

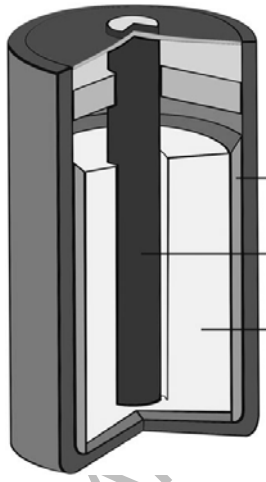
i. Describe the density of solids and gases based on the strength of intermolecular forces present among their particles. (4 Marks)

ii. Differentiate between amorphous and crystalline solids on the basis of the following properties. (3 Marks)

- Geometrical shape
- Melting points
- Symmetry

OR

b. Given below is zinc-carbon battery.



i. What is the anode, cathode and electrolyte made up of in the given dry cell battery? (3 Marks)

ii. How does the zinc-carbon battery work? Support your answer using balanced chemical equation for the reactions occurring at the anode and the cathode. (4 Marks)

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END OF PAPER

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