AGA KHAN UNIVERSITY EXAMINATION BOARD

HIGHER SECONDARY SCHOOL CERTIFICATE

CLASS XII EXAMINATION

MAY 2012

Chemistry Paper II

Time allowed: 2 hours 20 minutes Marks 55

INSTRUCTIONS

Please read the following instructions carefully.

1. Check your name and school information. Sign that it is correct.

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

2. RUBRIC. There are TEN questions. Answer ALL TEN questions. Questions 8, 9 & 10 each offer TWO choices. Attempt any ONE choice from each.

3. When answering the questions:

   Read each question carefully.
   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 scientific calculator if you wish.

Q.1. (Total 10 Marks)

a. List the following species in ascending order according to their size. Give a reason for your answer. (2 Marks)

$$Na^{+}, Al^{3+}, Mg^{2+}, Si^{4+}$$

Ascending order: _____

Reason: _____

_____

_____

b. Mention any THREE characteristics of beryllium which make it different from rest of the elements of the group. Suggest a suitable reason for this difference. (4 Marks)

1. _____

_____

2. _____

_____

3. _____

_____

Reason: _____

_____

c. Answer the following with the help of balanced chemical equations.

i. Why does potassium dichromate ($K_2Cr_2O_7$) act as an oxidizing agent when it reacts with oxalic acid? (2 Marks)

_____

_____

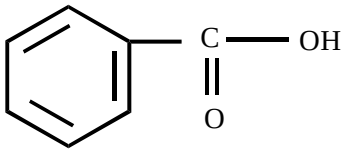
_____

_____

ii. How does potassium permanganate ($KMnO_4$) act as an oxidizing agent when it reacts with ferrous sulphate? (2 Marks)

Q.2. (Total 6 Marks)

a. Identify the functional group in the given structures. (3 Marks)

S. No.	Structure	Functional Group
i.		
ii.	$CH_3 - CH_2 - CH_2 - Br$	
iii.	$CH_3 - OH$	

b. The given equation shows a chemical reaction involving hydrocarbons.

$$\underset{\textbf{A}}{C_6H_{14}} \longrightarrow \underset{\textbf{B}}{C_2H_4} + \underset{\textbf{C}}{C_4H_{10}}$$

i. Write an equation to show the preparation of ethanol from hydrocarbon B. (1 Mark)

ii. Suggest a test to differentiate between hydrocarbons B and C. Give a reason for your suggestion. (2 Marks)

Test: _____

Reason: _____

Q.3. (Total 4 Marks)

a. Differentiate between E1 and E2 elimination reactions. (2 Marks)

S. No.	E1 reactions	E2 reactions
1.		
2.		

b. The reactivity of an alkyl halide depends upon the polarity of C – X bond. Justify the given statement. (2 Marks)

_____

_____

_____

_____

Q.4. (Total 4 Marks)

Define halogenonium ion. What will happen if the halogenonium ion attacks phenol? Show the mechanism of the reaction.

Space for mechanism

Q.5. (Total 6 Marks)

a.

i. Write the common and IUPAC name of HCHO. (2 Marks)

ii. Give TWO uses of HCHO. (2 Marks)

b. Write a complete balanced chemical equation for the reaction between carboxylic acid and carbonates. (2 Marks)

Q.6. (Total 4 Marks)

Why does milk become precipitated by the addition of lemon juice? Give any ONE significance of protein and name the protein present in milk.

Q.7. (Total 6 Marks)

a. Synthetic polyamides are widely used in textile fibres due to their high strength, elasticity, toughness and abrasion resistance.

i. Name any ONE example of a synthetic polyamide. (1 Mark)

_____

_____

ii. Draw the structure of any TWO possible reactants that could give rise to the above polyamide. (2 Marks)

Space for the drawing

b. What is smog? Name its TWO types along with its composition. (3 Marks)

_____

_____

_____

_____

_____

_____

Q.8. (Total 5 Marks)

EITHER

a. Explain the diversity and magnitude of organic compounds with reference to the unique properties of carbon. Also write any TWO uses of organic compounds.

OR

b. Reddish brown vapours of bromine and methane react with each other in the presence of sunlight or ultraviolet light or at high temperature. Describe the given reaction with the help of detailed mechanism of the chemical reactions involved.

Q.9. (Total 5 Marks)

EITHER

a. Describe the mechanism of base catalysed nucleophilic addition reactions of aldehydes and ketones by giving an example of addition of hydrogen cyanide (HCN). Include chemical equations to elaborate your answer.

OR

b. Discuss the following physical properties of carboxylic acids with the help of examples.

i. Solubility
ii. Boiling point

Q.10. (Total 5 Marks)

EITHER

a. Discuss any FIVE significances of pesticides.

OR

b. Explain the following methods of treatment for water purification. Write any ONE disadvantage of any ONE of the following methods.

i. Zeolite Process (Ion Exchange Method)
ii. Reverse Osmosis

END OF PAPER

Please use this page for rough work