**AGA KHAN UNIVERSITY EXAMINATION BOARD**

**SECONDARY SCHOOL CERTIFICATE**

**CLASS X**

**MODEL EXAMINATION PAPER 2023 AND ONWARDS**

**Chemistry Paper II**

**Time: 1 hour 50 minutes  Marks: 25**



**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.**<br>**Candidate's Signature** |
|---|
| |

**RUBRIC**

2. There are SIX questions. Answer ALL questions. Questions 5 & 6 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. Consider the following chemical equation.

$2H_{2(g)} + O_{2(g)} \rightleftharpoons 2H_2O_{(l)}$

i. Identify the direction in which the given equation shows endothermic reaction. (1 Mark)

_____

_____

ii. Give ONE reason to justify your answer to part i. (1 Mark)

_____

_____

b. Consider the given reaction at equilibrium.

$CO_{(g)} + H_2O_{(g)} \rightleftharpoons CO_{2(g)} + H_{2(g)}$

What will be the effect on the concentration of $H_2O$ if a small amount of CO gas is added to the reaction mixture? Give a reason to support your answer. (2 Marks)

_____

_____

_____

_____

Q.2. (Total 3 Marks)

a. What is meant by the term 'homologous series'? (1 Mark)

_____

_____

b. State the general formula for alkanes and alkynes. (2 Marks)

Alkanes: _____

_____

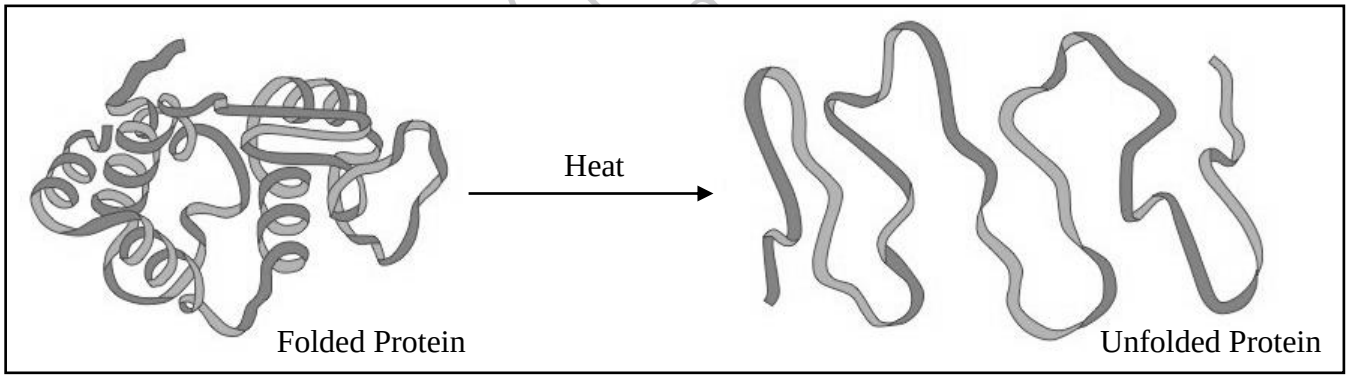
Alkynes: _____

_____



Q.3. (Total 3 Marks)

The given diagram illustrates the change in the structure of a protein molecule due to increase in temperature.




a. Name the process of changing a folded protein molecule into an unfolded protein molecule. (1 Mark)

_____

b. Write ONE chemical change that causes the unfolding of the protein molecule. (1 Mark)

_____

_____

c. What is the effect of unfolding on the function of the protein molecule? (1 Mark)

_____

_____

Q.4. (Total 3 Marks)

An ion exchanger is used domestically as well as on an industrial scale to make hard water soft.

a. Which type of hardness in water does the ion exchanger remove? (1 Mark)

_____

_____

b. Describe the process of removing hardness from water through ion resin. (1 Mark)

_____

_____

c. How can an ion exchange resin be renewed (reused)? (1 Mark)

_____

_____

Q.5. (Total 6 Marks)

**EITHER**

a. In a titration process, 15 $cm^3$ of 0.5 M dilute sulphuric acid is completely used to neutralise 10 $cm^3$ of sodium hydroxide solution.

Calculate the molarity of sodium hydroxide solution with the help of a balanced chemical equation. (6 Marks)

**OR**

b.

i. Using balanced chemical equation(s), show the complete steps of oxidation of the following organic compounds with potassium permanganate ($KMnO_4$) solution. (4 Marks)

I. Ethene

II. Ethyne

ii. Name the final products obtained on complete oxidation of (I) ethene and (II) ethyne in part i. (2 Marks)

Q.6. (Total 6 Marks)

**EITHER**

a. When petrol is burnt in an internal combustion engine of a car, the electrical spark which passes through the air/ petrol mixture produces gases such as ozone and oxides of nitrogen. The release of these gases from car exhaust considerably pollutes the environment.

i. Identify the main pollution problem caused by each of these gases. (2 Marks)

ii. Describe any TWO harmful impacts of each of the identified problems (in part i) on the environment. (4 Marks)

**OR**

b. A blast furnace is charged with haematite ore, coke and limestone from the top. It is then heated by blowing hot air in it from the base.

Using the given information, describe the stages that enable the extraction of iron from its ore. Write chemical equations to support your answer. (6 Marks)

END OF PAPER

# Please use this page for rough work

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