AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS X

MODEL EXAMINATION PAPER 2020

Chemistry Paper II

Time: 2 hours 15 minutes Marks: 35

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**

RUBRIC

2. 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. 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 4 Marks)

a. What is the basicity of sulphuric acid? Give a reason to support your answer. (2 Marks)

b. Write a chemical equation to show the stepwise dissociation of sulphuric acid in an aqueous medium. (2 Marks)

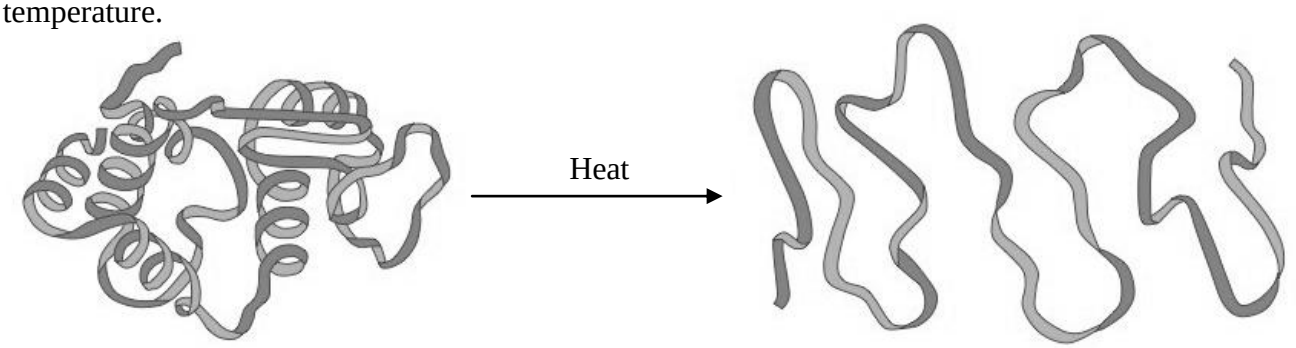
Q.3. (Total 4 Marks)

a. State the composition of natural gas. (2 Marks)

b. How does natural gas produce energy? Support your answer with the help of a balanced chemical equation. (2 Marks)

Q.4. (Total 3 Marks)

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



Folded Protein Unfolded Protein

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)

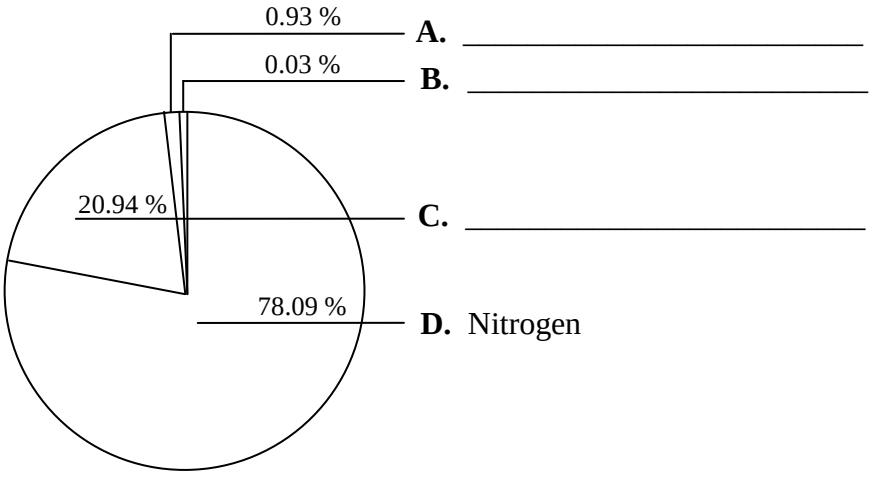
_____

_____

Q.5. (Total 3 Marks)

The given pie chart shows the composition of dry air with reference to percentage (%) by volume of gases.

Name the gases **A**, **B** and **C** as per their percentage composition**.**



A. _____

B. _____

C. _____

D. Nitrogen

Q.6. (Total 3 Marks)

Using balanced chemical equations, outline the reactions of Solvay process that take place in the following towers.

a. Carbonating tower (2 Marks)

_____

_____

_____

_____

b. Ammonia recovery tower (1 Mark)

_____

_____

Q.7. (Total 7 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.

i. What is meant by molarity (M)? (1 Mark)

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

OR

b.

i. Describe any TWO general characteristics of alkanes. (2 Marks)

ii. Draw the structural formulae of the TWO isomers with a molecular formula C_4H_{10}. (2 Marks)

iii. Show the formation of the following alkyl radicals from the alkane (isomers) mentioned in part ii. (3 Marks)

I. Isobutyl

II. Sec-butyl

III. Tert-butyl

Q.8. (Total 7 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)

iii. Suggest any ONE way by which air pollution by cars can be reduced. (1 Mark)

OR

b. When domestic effluent containing detergents are discharged in water bodies, they cause water pollution and death of aquatic life.

i. Explain how detergents lead to death of aquatic life. (4 Marks)

ii. Write any THREE harmful effects of water pollution on the environment in addition to the death of aquatic life. (3 Marks)

END OF PAPER

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