AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS X EXAMINATION

MAY 2014

Chemistry Paper II

Time: 2 hours 25 minutes Marks: 40

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 TEN questions. Answer ALL questions. Questions 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 simple calculator if you wish.

Q.1. (Total 3 Marks)

Write any THREE macroscopic characteristics of a forward reaction.

Q.2. (Total 3 Marks)

a. What is meant by the term ‘exothermic reaction’? (1 Mark)

b. The given equation shows an exothermic reversible reaction at equilibrium.

$$N_{2(g)} + 3H_{2(g)} \Leftrightarrow 2NH_{3(g)}$$

What will be the effect of the following conditions on the yield of ammonia?

i. Increase in temperature (1 Mark)

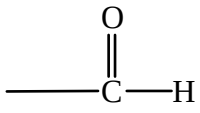
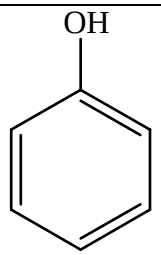
ii. Addition of a catalyst (1 Mark)

Q.3. (Total 3 Marks)

Describe which species (molecules and ions) can act as Lewis acids. Give ONE example of a Lewis acid.

Q.4. (Total 3 Marks)

Complete the given table with the missing information regarding detection of functional groups.

Reaction in Test Tube	Result	Functional group
2.0 cm^3 of 5% $NaHCO_3$ + a pinch of organic compound	Carbon dioxide gas evolves with effervescence	
Equal volumes of Fehling's solution A and B + a pinch of organic compound + boil for five minutes		
	Formation of voilet-purple solution	

Q.5. (Total 3 Marks)

Why are proteins important for the human body? Identify any TWO sources of proteins.

Q.6. (Total 3 Marks)

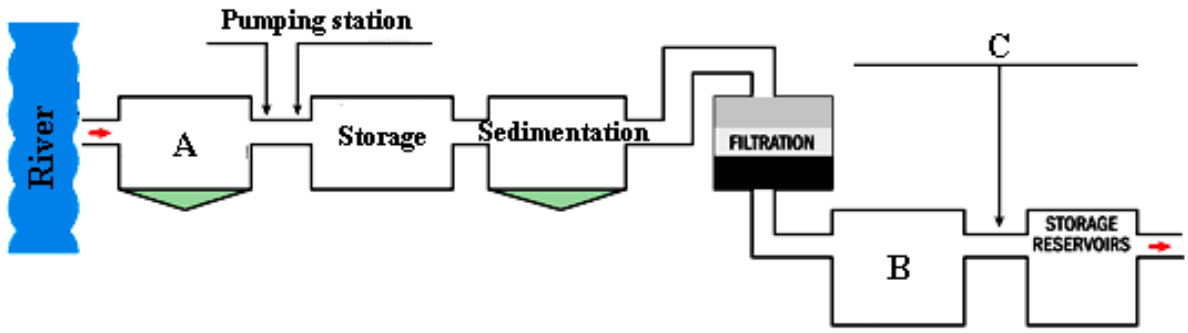
Nucleic acids are of two types: DNA and RNA.

i. What does DNA stand for? (1 Mark)

ii. Describe the structure of DNA. (2 Marks)

Q.7. (Total 3 Marks)

The diagram below shows water treatment, which consists of many steps.



i. At step **A**, screen and filters are used. What is the purpose of using them? (1 Mark)

ii Activated charcoal is used at step **B**. Give ONE reason for its use. (1 Mark)

iii At step **C** water is disinfected. What is commonly used for the disinfection of water? (1 Mark)

Q.8. (Total 4 Marks)

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

b. Which compound is manufactured by Solvay process? Write an equation to show the reaction of calcium oxide with water. (2 Marks)

Q.9. (Total 8 Marks)

EITHER

a. Describe any FOUR physical properties of acids. Write a chemical equation to show the reaction of sulphuric acid (H_2SO_4) with (i) potassium hydroxide (KOH) and (ii) ferrous sulphide (FeS).

OR

b. Hydrocarbons are not only important as fuel but they are also used as raw material (feed stock) in many industries.

Explain the use of hydrocarbons as feedstock in the following industries naming the major products formed from these hydrocarbons and the commonly used items manufactured from the identified products.

i. Petrochemical industry

ii. Plastic industry

iii. Rubber industry

iv. Synthetic fibre industry

PLEASE TURN OVER THE PAGE

Q.10. (Total 7 Marks)

EITHER

a. Describe any TWO sources and TWO effects of each of the following air pollutants.

i. Sulphur dioxide

ii. Carbon monoxide

OR

b. What is meant by temporary hardness in water? Describe the following methods of removing temporary hardness from water. Give necessary chemical equations.

i. Boiling

ii. Clark's method

END OF PAPER

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