THE VILLAGE
INTERNATIONAL SCHOOL
"We Nurture Dreams"

Chemistry Marks:
80

General Instructions:

1. Answer to this Paper must be written on the paper provided separately.
2. You will not be allowed to write during first 15 minutes.
3. This time is to be spent in reading the question paper.
4. The time given at the head of this Paper is the time allowed for writing the answers.
5. Section A is compulsory. Attempt any four questions from Section B.
6. The intended marks for questions or parts of questions are given in brackets [ ].

SECTION - A

(Attempt all questions from this Section.)

QUESTION 1.

Choose the correct answers to the questions from the given options. [15]

(Do not copy the questions, write the correct answer only.)

(i) Identify one statement that holds true for electrolysis of molten lead bromide.
(a) Silver grey metal deposits at the anode.
(b) Temperature is not maintained during electrolysis.
(c) Brown vapours of bromine are obtained at the anode.
(d) Electrolyte contains H^+ ions along with Pb^{2+} ions.

(ii) If the pH of a solution is '2', then the solution is a
(a) strong acid
(b) strong alkali
(c) weak acid
(d) weak alkali

(iii) Which of the following statements is correct about an aqueous solution of an acid and of a base?
(i) Higher the pH, stronger the acid
(ii) Higher the pH, weaker the acid
(iii) Lower the pH, stronger the base
(iv) Lower the pH, weaker the base
(a) (i) and (iii)
(b) (ii) and (iii)
(c) (ii) and (iv)
(d) (i) and (iv)

(iv) Which of the following is a weak electrolyte ?
(a) Sodium chloride (b) Benzene
(c) Sodium acetate (d) Ammonium acetate

(v) 10^{-6}M HCl is divided to 100 times its pH will be (a)
6.0 (b) 8.0
(c) 9.5 (d) 6.95

(vi) The electron affinity of Be is similar to
(a) Na (b) B
(c) Li (d) He

(vii) Nitric acid was also known as :
(a) aqua fortis (b) aqua guard
(c) aqua hydroxide (d) aqua nitrate

(viii) An element X has an atomic number 15. With which of the following elements will it show similar chemical properties?
(a) N (7) (b) Ne (10)
(c) O (8) (d) Be (4)

(ix) Nitric acid turns orange coloured methyl orange.
(a) Red (b) Orange
(c) Pink (d) Blue

(x) Heating sodium acetate with soda lime produces :
(a) Ethane (b) Methane
(c) Ethene (d) Ethyne

(xi) The colour of the precipitate formed after the addition of a small amount of sodium hydroxide solution to an aqueous solution of ferric chloride is
(a) gelatinous white (b) pale blue
(c) reddish brown (d) dirty green

(xii) Ammonia is manufactured by the Haber's process using iron catalyst. Which of the following statements is incorrect?

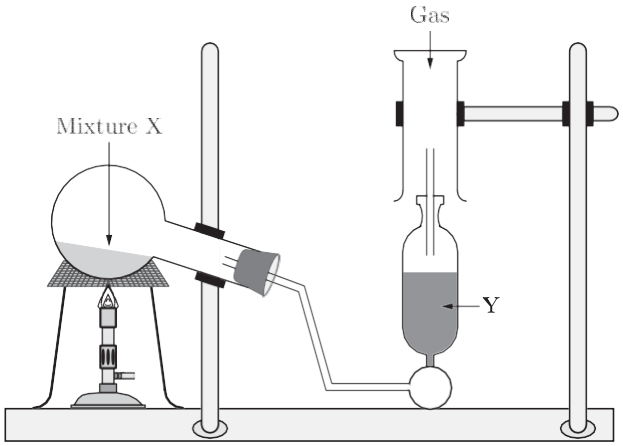
(a) Nitrogen is reduced by hydrogen
(b) It is not possible to obtain a 100% yield of ammonia
(c) The iron catalyst is used to increase the speed of the reaction.
(d) A higher temperature will increase the yield of ammonia

(xiii) An element with the atomic number 19 will most likely combine chemically with the element whose atomic number is :

(a) 18 (b) 11
(c) 17 (d) 20

QUESTION 2.

(i) The diagram shows an experimental set up for the laboratory preparation of a pungent smelling gas. The gas is alkaline in nature. [5]



(a) Name the gas collected in the jar.
(b) Write the balanced equation for the above preparation.
(c) How is the gas being collected ?
(d) Name the drying agent used.
(e) How will you find that the jar is full of gas ?

(ii) Match the following Column-I with Column-II: [5]

Column-I	**Column-II**
(i) Sulphur dioxide	(a) Sulphuric acid
(ii) Oil of vitriol	(b) Burning sulphur smell
(iii) Oleum	(c) Rotten egg smell
(iv) Sulphur trioxide	(d) Pyrosulphuric acid
(v) Hydrogen sulphide	(e) Anhydride of sulphuric acid.

(iii) Complete the following by choosing the correct answers from the bracket: [5]

(a) Across a period, the ionisation potential_____. (increases, decreases, remains same).

(b) A salt prepared by displacement reaction is_____. (ferric chloride, ferrous chloride, silver chloride)

(c) Aluminium powder, a constituent of paints, prevents_____. (heat radiation/ formation of rust/conduction of electric current).

(d) The black colour disappears learning a---------- solution when adding sulphuric acid to copper oxide.

(e) When sodium chloride is heated with concentrated sulphuric acid below 200°C, one of the products formed is_____. (sodium hydrogen sulphate/sodium sulphate/ chlorine)

(iv) Identify the following: [5]

(a) The amount of energy released when an atom in the gaseous state accepts an electron to form an anion.

(b) The alkali metal in the third period.

(c) The elements present in the first period.

(d) An element having highest electro-negativity.

(e) The noble gas with duplet arrangement of electrons.

(v) (a) Draw the structural formula for each of the following : [5]

1. 2, 2 dimethyl pentane
2. methanol
3. Iso propane

(b) Write the IUPAC name for the following compounds :

1. acetaldehyde
2. acetylene

SECTION - B

(Attempt any four questions.)

QUESTION 3.

(i) Write the molecular formulae of the third and fifth members of homologous series of carbon compounds represented by the generally formula C_nH_{2n-2}. [2]

(ii) Write a balanced chemical equation for each of the following reactions : [2]

(a) Action of dilute sulphuric acid on sodium hydroxide.

(b) Action of dilute sulphuric acid on zinc sulphide.

(iii) (a) Outline the steps necessary to convert insoluble lead (II) oxide into soluble lead (II) chloride. [3]

(b) If iron reacts with dilute sulphuric acid, what will be the products ?

(c) A solution of iron (III) chloride has a pH less than 7. Is the solution acidic or alkaline ?

QUESTION 4.

(i) Distinguish between the following pairs of compounds using the test given within brackets:

(a) Iron (II) sulphate and iron (III) sulphate (using ammonium hydroxide) [3]

(b) A lead salt and a zinc salt (using excess ammonium hydroxide)

QUESTION 5.

(i) Write down the equations for following reactions : [2]

(a) When ammonium chloride is warmed with sodium hydroxide solution.

(b) When ammonium chloride is warmed with concentrated sulphuric acid.

(ii) (a) Classify the solutions of the following as acids, bases or salts : Ammonium hydroxide, barium chloride, sodium chloride, sodium hydroxide, H_2SO_4 and HNO_3. [2]

(b) Explain how a reagent chosen from those above enables you to distinguish between the two acids mentioned therein.

(iii) An element X has atomic number 16. Answer the following questions. [3]
(a) State the period and group to which X belongs?
(b) Is X a metal or a non-metal?
(c) What is the valency of X?

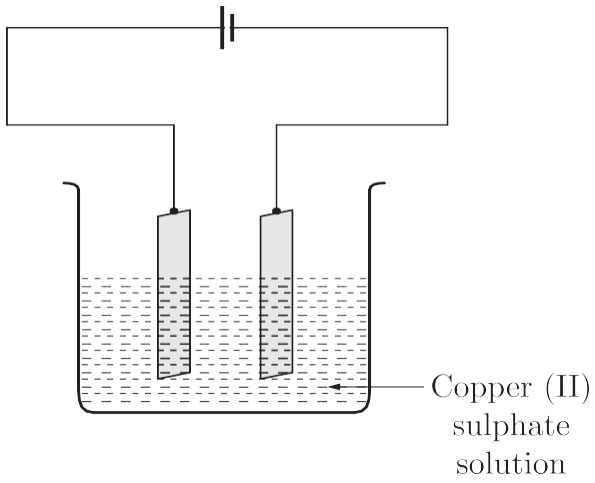
(iv) (a) What is the type of reaction taking place between ethane and chlorine to form monochloroethane ? [3]
(b) The reaction between ethene and chlorine forms only one product. Name the type of this reaction.
(c) (1) Draw the structural formula of ethene.
(2) What is the feature of the ethene structure which allows ethene to react with chlorine in the way it does ?

QUESTION 6.

(i) State : [2]
(a) Gay Lussac's law of gaseous volumes
(b) Avogadro's law.

(ii) From the list of the following salts choose the salt, that most appropriately fits the description given in the following : [2]
[AgCl, $MgCl_2$, $NaHSO_4$, $PbCO_3$, $ZnCO_3$, KNO_3, $Ca(NO_3)_2$]
(a) A deliquescent salt.
(b) An insoluble chloride.

(iii) Copper sulphate solution is electrolysed using copper electrodes. [3]
Study the diagram given below and answer the question that follows:



(a) Which electrode to your left or right is known as the oxidising electrode and why?
(b) Write the equation representing the reaction that occurs.
(c) State two appropriate observations for the above electrolysis reaction.

(iv) (a) The metal plate through which current enters into an electrolyte is called_____and it has_____of electrons. [3]

(b) The metal plate through which current leaves from an electrolyte is called_____and it has_____of electrons.

(c) The ions which discharge on the negative electrode during electrolysis_____ electrons. Thus the ions are said to be_____.

QUESTION 7.

(i) Name the following: [3]

(a) Process by which ethane is obtained from ethene.

(b) A hydrocarbon which contributes towards the green house effect.

(c) Distinctive reaction that takes place when ethanol is treated with acetic acid.

(ii) The pH values of three solutions A, B and C are given in the table. Answer the following questions: [3]

Solution	pH value
A	12
B	2
C	7

(a) Which solution will have no effect on litmus solution ?

(b) Which solution will liberate CO_2 when reacted with sodium carbonate?

(c) Which solution will turn red litmus solution blue ?

(iii) (a) (1) Give two large-scale uses of nitric acid. [4]

(2) A sample contains nitric oxide. The nitric oxide can be removed by passing the mixture through solution 'S'. Name the solution 'S'.

(3) Nitrogen can be obtained in pure state by heating a mixture of ammonium chloride and a substance X. Name the substance X.

(b) Nitrogen dioxide is called mixed anhydride. Explain.

QUESTION 8.

(i) Write the equation for each of the following reactions : [2]

(a) Sulphur is heated with concentrated sulphuric acid.

(b) Ammonium chloride is heated with sodium hydroxide.

(ii) (a) Name two compounds that are covalent when taken pure but produce ions when dissolved in water. [2]

(b) For each compound, give the formulae of the ions formed in aqueous solutions.

(iii) Give one test each to distinguish between the following pairs of chemicals : [3]

(a) Zinc nitrate solution and calcium nitrate solution.

(b) Sodium nitrate solution and sodium chloride solution.

(c) Iron (III) chloride solution and copper chloride solution.

(iv) State one relevant observation for each of the following reactions. [3]

(a) Ammonium hydroxide solution is first added in a small quantity and then in excess to a solution of copper sulphate.

(b) Sodium acetate is added to sodium hydroxide.

(c) Ammonia gas is passed over heated copper oxide.

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