

LILAVATIBAI PODAR HIGH SCHOOL (ISC)

Preliminary Examination -2018-19

Subject : Chemistry

Time : 2 hours

Class : X

Points : 80

(Candidates are allowed additional 15 minutes for only reading the paper.

They must **NOT** start writing during this time)

Section I is compulsory , attempt any four questions from section II

Intended marks for question questions or parts of questions are given in brackets []

SECTION I (40 marks) Attempt all questions

Question One

- i. **State any one observation for each of the following** [5]
- MnO₂ is heated with concentrated HCl
 - Lead nitrate is heated in presence of copper and concentrated sulphuric acid
 - Ammonia is burnt in excess of oxygen
 - Excess of ammonium hydroxide is added to copper sulphate solution
 - Dilute sulphuric acid is added ferrous sulphide and the gas is passed through lead acetate paper
- ii. **Identify the term / process** [5]
- The amount of energy released when an electron is added to isolated gaseous atom
 - Protection of iron by coating with a thin layer of zinc
 - Tendency of an element to form chains of identical atoms
 - A covalent bond where both the electrons are given by single atom for sharing.
 - The process of extracting metals by electrolysis
- iii. **Choose the correct answer from the following options given:** [5]
- The electrolyte used for electroplating silver is
 - Silver nitrate
 - Sodium argento cyanide
 - Silver chloride
 - Silver sulphate
 - The element with the highest electron affinity is
 - Fluorine
 - Chlorine
 - Bromine
 - Iodine
 - Brass is an alloy of
 - Copper and tin
 - Copper and zinc
 - Zinc and lead
 - Lead and tin
 - The gas liberated when ammonia is burnt with CuO is
 - O₂
 - NO₂
 - NO
 - N₂
 - The second homologue of alkyne is
 - Ethyne
 - Butyne
 - Propyne
 - Pentyne

This paper consist of 4 printed sides

[5]

iv. Calculate the following

- Volume occupied by 1.4 g of N_2 at S.T.P ($N=14$) at S.T.P
- Mass occupied by 11.2 Litres of CO_2 at S.T.P ($C=12, O=16$) at S.T.P
- Number of moles in 0.49 g of H_2SO_4 ($H = 1, S = 32, O = 16$)
- Number of molecules in 51 gms of ammonia [$N=14, H=1$]
- Volume occupied by 16 grams of a gas having vapour density as 32 at S.T.P

v. Give balanced chemical equations for each of the following

[5]

- Excess of ammonia with chlorine
- Sulphur with concentrated sulphuric acid
- Carbon with concentrated nitric acid
- Acetic acid with ethyl alcohol in presence of concentrated sulphuric acid
- Magnesium bicarbonate with dilute HCl

vi. Rewrite the following by changing only the underlined word / words

[5]

- Ammonium chloride when heated with HCl solution liberates ammonia gas
- Electrolysis of pure water gives oxygen gas at anode and hydrogen gas at the cathode
- Calcium carbonate is a soluble salt
- Water has ionic, covalent, as well as coordinate bonds
- Acetic acid can form normal as well as double salts

vii. Arrange the following as per the instructions given in the brackets

[5]

- Na, Cs, K, Li [increasing order of ionization potential]
- B, Li, F, O [increasing order of electronegativity]
- Methane, O_2 , F_2 , N_2 [increasing number of covalent bonds]
- NO_3^- , SO_4^{2-} , Cl^- , OH^- [increasing order of its ability to get discharged at anode]
- Mg, Si, Na, Cl [increasing atomic size]

viii. Give the IUPAC name of the following

[5]

- CH_3COOH
- C_2H_5OH
- $CH_3-\underset{\substack{| \\ C_2H_5}}{CH}-CH_3$
- $CH_2=CH-\underset{\substack{| \\ CH_3}}{CH}-CH_3$
- $CH_3-\underset{\substack{| \\ Br}}{CH}-CH_2-CH_3$

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Section II (40 marks)

Attempt any four questions from section II

Question 2

- Mention the balanced chemical equations for the preparation of the following salts [4]
from the list given: [dilute sulphuric acid, copper, iron, sodium, copper(II)oxide, sodium carbonate, sodium hydroxide, zinc nitrate, dilute HCl, Chlorine gas] [one reagent can only be used once]
 - Sodium sulphate
 - Zinc carbonate
 - Copper(II) chloride
 - Iron(III)chloride
- There are four elements M, N, O, P and Q having electronic configuration 19, 17, [3]
8, 6 and 1 respectively. Answer the following questions

- i. Formulae of the compound formed between N and P
 - ii. Formulae of a covalent compound having two bond pairs and two lone pairs
 - iii. Nature of bonding between M and N
- c. Distinguish between following pairs of compounds [3]
- i. Ferrous nitrate solution and Ferric nitrate solution
 - ii. Solid sodium carbonate and solid sodium sulphite
 - iii. Zinc nitrate solution and Lead nitrate solution

Question 3

- a. Consider the section of the periodic table given below. Some elements are given in their own symbol and position in the periodic table, while others are shown with a letter with reference to the table. Answer the following questions: [6]

Group No. →	I A	II A	III A	IV A	V A	VI A	VII A	Zero
	1	2	13	14	15	16	17	18
Periods	2	Li		D			O	Ne
	3	A	Mg	E	Si	M	X	T
	4	Q	R		Z	G		L

- i. Which is the most electronegative element?
 - ii. How many valence electrons are present in G?
 - iii. Write the electronic configuration of Y
 - iv. State the type of bond formed between A and X. Also write the formula of the compound formed
 - v. Name the element which lowest ionization potential in period 4
- b. State the observations to each of the conclusions for reagents added to A, B, C and D solution respectively. [4]
- i. Test : A solution is added to $BaCl_2$ solution followed by addition of dilute HCl.
Conclusion : A contains SO_4^{2-}
 - ii. Test : silver nitrate is added to solution B followed by addition of ammonium hydroxide . Conclusion : B contains Cl^- ions
 - iii. Test : Excess NaOH is added to solution C. conclusion : C contains Ca^{2+} ions
 - iv. Test : to solution D , freshly prepared ferrous sulphate is added followed by addition of concentrated sulphuric acid. Conclusion : D contains NO_3^- ions

Question 4

- a. Draw two chain isomers of C_4H_{10} [2]
- b. Write balanced equations for the following [5]
 - i. Sodium ethanoate with soda lime
 - ii. Ethanol with concentrated sulphuric acid at $170^\circ C$
 - iii. Calcium carbide with water
 - iv. Ethyl bromide with aqueous NaOH
 - v. Ethyl bromide with alcoholic KOH
- c. Compound A on reacting with bromine water gives 1,2-dibromo ethane. [3]
 - i. Identify A
 - ii. Mention the type of reaction exhibited by A with bromine water.
 - iii. Write balanced equation of A with hydrogen in presence of Ni at $300^\circ C$

Question 5

- a. i. Name the chief ore for extraction of aluminium [6]
ii. Explain : Metal oxides are basic by nature , yet Al_2O_3 can react with $NaOH$
iii. Explain : Al_2O_3 is reduced to aluminium by electrolysis
iv. Name the compound added to pure alumina to lower the fusion temperature during electrolysis
v. Write the equation at cathode for electrolysis of pure alumina
vi. Name the process used for electrorefining of aluminium
- b. Reduction of iron (III) oxide by carbon monoxide takes place as follows [4]
 $Fe_2O_3 + 3 CO \rightarrow 2Fe + 3 CO_2$ Calculate the following
i. Weight of Fe_2O_3 when 67.2 L of CO reacts
ii. Weight of Fe formed at the same time
iii. Volume of CO_2 liberated at the same time
iv. Number of moles in 67.2 L of CO [$Fe = 56, O = 16, C = 12$]

Question 6

- a. i. Write the balanced equation for haber's process [4]
ii. Name the catalyst for haber's process
iii. How is ammonia separated from unreacted N_2 and H_2 in haber's process
iv. Write balanced equation of magnesium nitride with warm water
- b. Complete the following table by writing the reaction at cathode and anode [3]
respectively

Electrolyte	Cathode	Anode	Electrolytic reaction at cathode	Electrolytic reaction at anode
Molten lead bromide	Iron	graphite		
Copper sulphate solution	Copper	Copper		

- c. Mention the property exhibited by sulphuric acid in the following reactions [3]
i. Ethyl alcohol with concentrated sulphuric acid
ii. Carbon with concentrated sulphuric acid
iii. $NaCl$ with concentrated sulphuric acid

Question 7

- a. For laboratory preparation of HCl , answer the following questions [4]
i. Write balanced equation for preparation of HCl in laboratory
ii. Name the drying agent for lab preparation of HCl
iii. How is HCl gas collected ? Justify the answer
- b. Give reasons [3]
i. Temperature should not be more than $200^\circ C$ for lab preparation of HCl
ii. Nitric acid in laboratory is slightly yellowish brown in colour.
iii. Solid $NaCl$ is a bad conductor of electricity
- c. State any one difference between the following [3]
i. Electroplating and Electrorefining
ii. Roasting and Calcination
iii. Ethane and Ethene

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