ICSE Chemistry: Model Paper 3

Answers to this Paper must be written on the paper provided separately.
You will not be allowed to write during the first 15 minutes.
This time is to be spent in reading the Question Paper.
The time given at the head of this paper is the time allowed for writing the answers.

Section I is compulsory. Attempt any four questions from Section II.
The intended marks for questions or parts of questions are given in brackets [].

SECTION I (40 Marks)
*Attempt **all** questions from this Section*

Question 1:

(a). Fill in the blanks with appropriate word/s in each case :

(i) Increase in nuclear charge of an atom _____ [decreases/increases] the tendency of the atom to lose electrons.
(ii)Electrons with low electronegativity are usually _____ [metallic/non-metallic].
(iii) An atom is said to be a non-metal if it _____ [gains/loses] one or more electrons.
(iv)Covalent compounds are formed by sharing electron pairs between non-metallic atoms. Non-metallic atoms having ___, ___, ____ Valence electrons [4, 5, 6, 7] share one, two or three pairs of electrons respectively.
(v) The covalent molecule containing three single covalent bonds is _____ [water / methane / ammonia]

(b) Give reason/s for the following :

(i) NH_3 gas a covalent compound dose not conduct electricity but its aq.soln. NH_4OH is a weak electrolyte.
(ii) Concentrated sulphuric acid is a weaker acid compared to dilute sulphuric acid.
(iii) Zinc chloride is stored in air tight bottles.
(iv) Sulphuric acid forms two types of salts on reaction with an alkali.
(v)The metals - copper, silver and lead are electrorefined but K, Na and Ca are not.

(c)Complete the following :-

(i) Salts of _____ [normal/transition] elements are generally coloured.
(ii) The hydroxide which is soluble in excess of NaOH is _____ [$Zn(OH)_2$ / $Fe(OH)_3$ / $Fe(OH)_2$]
(iii) The salt which will not react with NH_4OH solution _____ [$ZnCl_2$/$CuCl_2$/NH_4Cl /$FeCl_2$]
(iv) The electrode at which anions donate excess electrons and are oxidized to neutral atoms is the _____ [anode/cathode]
(v) Salts ionize in aq.soln. on passage of electric current to give _____ [negative / positive] ions other than H+ ions.

(d) Define the following :-

(i) Molecular weight, (ii) Molecular formula, (iii) Empirical formula, (iv) Aqua Regia and (v) Electrolysis.

(e) Name the following :-

(i) A metal other than Zinc which displaces copper fro copper [II] sulphate solution.

(ii) The form of Iron which has 0.1 to 0.5% carbon impurity and is used in making nuts and bolts.

(iii) A metal other than Mercury present in a liquid amalgam.

(iv) The ions obtained when HCl dissociates in aqueous solution.

(v) The ion responsible for acidic nature of HCl acid.

(f) State the colour of :-

(i) The phenolphthalein solution after passage of ammonia through it.

(ii) Copper [II] hydroxide solution after addition of ammonium hydroxide in excess of it.

(iii) Pure nitric acid.

(iv) Concentrated sulphuric acid.

(v) Crystal of hydrated copper [II] sulphate.

(g) Select the correct answer from the choice given in the brackets :-

(i) The vapour density of the fifth member of the homologous series of alkanes is _____ [22/36/29].

(ii) The isomer of pentane which has '1' C atom attached to '4' other C atoms is _____ [n – / iso – / neo –] pentane.

(iii) The IUPAC name of the product of reaction of ethylene with hydrogen bromide is _____ [ethyl bromide / bromoethane / dibromoethane].

(iv) The IUPAC name of methyl acetylene is _____ [1-butyne / propyne / ethyne].

(v) The functional group in ethanoic acid is _____ [aldehyde / carboxyl / hydroxyl].

(h) Complete the following equation : -

(i) $Zn + dil.\ H_2SO_4 \rightarrow$

(ii) $Na_2SO_3 + dil.\ H_2SO_4 \rightarrow$

(iii) $NaCl + conc.\ H_2SO_4 \rightarrow$

(iv) $MnO_2 + conc.\ HCl \rightarrow$

(v) $NH_4Cl = NaOH \rightarrow$

SECTION II (40 marks)

*Attempt **ANY FOUR** from this section*

Question 2:

(a) How is methane prepared in the laboratory. Give balanced chemical equation for this. Write electron dot and structural formula of methane. [3]

(b) How will you distinguish ethane, ethane and ethyne. [3]

(c) Write uses of methane, ethane, ethane and ethyne. [4]

Question 3:

(a) Why alkali metals and alkaline earth metals are light, soft and highly reactive. [3]

(b) State the differences between roasting and calcinations. [2]

(c) Separate the volatile and non-volatile from the following :-

$MnO, CaSiO_3, SO_2, SiO_2, FeSiO_3, CO, MnSiO_3, P_2O_5$.

(d) Write the equation for the reaction of Zinc with Sulphuric acid, Sodium hydroxide and aqueous solution of Copper sulphate. [3]

Question 4: What happens when: [5]

(a) HCl is added to
(i) Lead nitrate solution,
(ii) Sodium carbonate solution,
(iii) CuO and
(iv) NH_4OH solution. Give also chemical equation in each case.

(b) Give the reaction for the laboratory preparation of ammonia. Why H_2SO_4, P_2O_5 or $CaCl_2$ is not used as a drying agent. [5]

Question 5:

a) Name the compounds required for the preparation of Nitric acid. Give the balanced chemical equation for the reaction. [2]

(b) What happens when nitric acid reacts with Cu, H_2S and SO_2? [3]

(c) Write with balanced chemical equation, the action of heat on: KNO_3, $Pb(NO_3)_2$, NH_4NO_3, $AgNO_3$ and $Cu(NO_3)_2$. [5]

Question 6:

(a) How sulphur dioxide is prepared in the laboratory ? How is the gas purified ? Give one reaction each with an alkali, carbonate solution and basic oxide. [5]

(b) Write the balanced chemical equation for the reaction of sulphuric acid with : Fe, Cuo, NaOH, $CuCO_3$ and Na_2SO_3. [5]

Question 7:

(a) Name one strong and one weak electrolyte that is acid. [2]

(b) Choose the correct alternative:

(i) Electrolytic dissociation takes place in _____ [electrovalent/covalent] compound.
(ii) In the electrolysis of fused lead bromide, graphite anode is preferred since it is _____ [unaffected/ affected] by the reactive bromine vapour.
(iii) Dilute sulphuric acid is preferred to dilute nitric acid for acidification since _____ [nitric/sulphuric] acid is a volatile acid [3]

(c)

(i) How will you differentiate SO_2 and CO_2?

(ii) On passing excess of NH_3 through $CuSO_4$ solution we gwt deep blue colour due to presence of _____ {$(NH_4)_2SO_4$ / $[Cu(NH_3)_4].SO_4$ / $Cu(OH)_2$}.

(iii) H_2S turns moist lead acetate paper silvery black due to presence of _____ [H_2S / PbS]

(iv) When Na_2CO_3 is added and heated with acid carbon dioxide [is evolved / not evolved]

(v) Acidified solution of Na_2SO_3 and Na_2SO_4 is taken in test tubes A and B respectively. A solution of $BaCl_2$ is added to both the test tubes. A white precipitate soluble in HCl is formed in the test tube _____ [A / B].

Question 8:

(a) Copper on reacting with conc. H_2SO_4 produces copper sulphate. If 1.28 g of copper is to be converted to copper sulphate. Find

(i) the weight of copper sulphate formed and

(ii) the weight of the acid required [Cu = 64, S = 32, O = 16].

(b) Calculate the volume of oxygen required to burn completely a a mixture of 22.4 dm^3 of CH_4 and 11.2 dm^3 of H_2.[all volumes are measured at STP] [1 dm^3 = 1 litre] [5]