CHEMISTRY 2016

Time: 20 Minutes Max. Marks: 17

SECTION "A" (MULTIPLE CHOICE QUESTIONS)

1. Choose the correct answer for each from the given options:

(i) Hydrides of group-IV A a.e:
* Acidic * Basic * Neutral * Amphoteric

(ii) Ruby is an oxide of:
* Zinc * Aluminium * Copper * Iron

(iii) The electronic configuration of the outer shell of an element is $4s^2$, $3d^{10}$, $4p^1$. It belongs to:
* IA group and 3rd period * IIA group and 4th period
* IIIA group and 3rd period * IIIA group and 4th period

(iv) H_2S is: * an oxidizing agent * a reducing agent
* a sulphonating agent * a bleaching agent

(v) Sodium amalgam is an alloy of:
* Sodium and Lead * Sodium and Mercury
* Sodium and Iron * Sodium and Silver

(vi) Elements of group IB are called:
* Alkali metals * Rare earth metals
* Alkaline earth metals * Coinage metals

(vii) Rhombic sulphur and Monoclinic sulphur are in equilibrium at this temperature:
* 95.5°C * 96.6°C * 105°C * 113°C

(viii) Stainless steel is an alloy of: * Fe, Cr and Ni
* Al, Cu and Ni * Al, Cr and Zn * Fe, Cu and Al

(ix) Propanal and Propanone are:
* Chain isomers * Position isomers
* Metamers * Functional group isomers

(x) This is a natural polymer:
* Cellulose * PVC * Nylon * Terylene

(xi) The number of monosaccharide units in oligosaccharides is:
* 2 – 8 * 2 – 10 * 2 – 12 * 2 – 20

(xii) This is the general formula of ketones:
* $R-\overset{\displaystyle O}{\overset{|}{C}}-H$ * $R-\overset{\displaystyle O}{\overset{||}{C}}-R$ * $R-\overset{\displaystyle O}{\overset{||}{C}}-OH$ * R – O – R

(xiii) Another name for Wood spirit is: * Ethyl alcohol
* Methyl alcohol * Propyl alcohol * Butyl alcohol

(xiv) Cod liver oil is a source of:
* Vitamin A * Vitamin B * Vitamin C * Vitamin K

(xv) This acid is used for etching of glass:
* HF * HCl * HBr * HI

(xvi) Ethyl acetate is present in:
* Pineapple * Orange * Guava * Lemon

(xvii) This is used to increase the Octane number and efficiency of petrol: * Ni * Pt * V_2O_5 * $(C_2H_5)_4Pb$

CHEMISTRY 2016

Time: 2 Hours 40 Minutes Marks: 68

SECTION 'B' (SHORT-ANSWER QUESTIONS)(40)

NOTE: Attempt any Five questions from Inorganic Chemistry and Five questions from Organic Chemistry.

INORGANIC CHEMISTRY

2.(i) Write I.U.P.A.C. names of the following:
* $[Co(NH_3)_3Cl]$ * $[Cr(en)_3]Cl_3$
* $Na_3[Cu(OH)_2(NO_3)_2]$ * $Na_2[Fe(CN)_5NO]$

(ii) What is Aqua Regia? How does Gold dissolve in it? Give the reactions.

(iii) Give scientific reasons for the following:
* Zinc hydroxide is soluble in excess of Sodium hydroxide solution.
* Alkali and alkaline earth metals form only +1 and +2 ions respectively.
* Atomic size of Sulphur is bigger than that of Osygen.
* Plastic Sulphur is elastic.

(iv)(a) Define the term isotope. Explain the various isotopes of Hydrogen.

(b) Mention the simplest ions of Hydrogen and show their reactions with water.

(v) Describe two methods for the preparation of Water gas and give two methods for the separation of pure Hydrogen from it.

(vi) Write equations for the following reactions:
* Conx. Sulphuric acid with Oxalic acid
* Nitric acid with Sulphur * Fe^{+3} with H_2S
* Blue stone treated with KI

(vii)(a) Write the chemical formulae of the following:
* Suhaga * Alunite * Murda sang * Chromite ore

(b) Draw the structure of the following:
* Chelating agent * Chelate

(viii) With the help of Crystal field theory, explain the colour of Transition metal complex ions.

ORGAMIC CHEMIXTRY

(ix) Define the following terms: * Homologous Series
* Cracking * Isomerism * Saponification

(x) Draw and explain the orbital structure of Acetylene.

(xi) Give chemical test to distinguish between the following:
* Aldehyde and Ketone * Paraffin and Olefin
* n-Hexane and Benzene * 1-Butyne and 2-Butyne

(xii) Describe free radical mechanism reaction of Chlorimation of Methane in presence of sunlight, giving all the equations involved.

(xiii) What happens when?
* Ethylene react with cold aqueous $KMnO_4$ solution
* Methanol reacts with steam
* 2-Propanone is oxidized in presence of $K_2Cr_2O_7$ and conc. H_2SO_4
* Ethyl chloride reacts with Sodium metal

(xiv) (a) Explain the essential Fatty acids.
(b) Draw the structure of the following:
* Lysine * Nicotinamide

(xv) What is fermentation? Explain the manufacture of Ethanol from starch.

(xvi) Why do 1° Alkyl halides give SN^2 mechanism while 3° Alkyl halides give SN^1 mechanism?

SECTION'C' (DETAILED- ANSWER QUESTIONS)

NOTE: Attempt Two questions – One question from Inorganic Chemistry & other from Organic Chemistry28

INORGANIC CHEMISTRY

3.(a) Describe the extraction of 99.99% Copper from roasted pyrite ore.

(b) Complete and balance the following equations:
* $K_2Cr_2O_7 + H_2SO_4 \xrightarrow{conc}$ * $KI + K_2Cr_2O_7 + H_2SO_4 \rightarrow$
* $NaOH + Cl_2 \xrightarrow[conc]{hot}$ * $Mg + HNO_3 \xrightarrow[dilute]{Cold}$
* $K_2MnO_4 + Cl_2 \longrightarrow$

(c) What are the types of elements based on electronic configuration in the periodic table?

4.(a) Give the industrial preparation of Sodium carbonate (Na_2CO_3) by Ammonia-solvay process.

(b) Give the manufacture of Sulphuric acid by contact process.

(c) Write notes on the following: * Tin plating * Borax

ORGANIC CHEMISTRY

5.(a) Give the equations of the following:
* Reaction of Ethanal with Grignard reagent
* Decomposition of Acetic acid in the presence of MnO_2
* Reaction of Sodium benzoate with Soda lime
* Reaction of Methanal with caustic soda
* Reaction of Chloroethane with Sodium ethoxide

(b) Give the preparation of the following:
* 2-Bromo propane from 1-Bromo propane
* Phenol from Benzene * Benzoic acid from Benzene
* Isopropyl alcohol from 1-Propanol

(c) Describe Kekule structure of Benzene. Write the objection against it. How was this objection removed by Kekule?

6.(a) What is Elimination reaction? Explain the mechanism of E_1 and E_2 reactions.

(b) Write note on any one of the following:
* Detergents * Plastics

(c) Write the I.U.P.A.C. names of the following:
(i) $(C_6H_5)_3CBr$ (ii) $C_2H_5OCH(CH_3)_2$

(iii) $H_2C=CH-\underset{\displaystyle |}{\overset{\displaystyle Cl}{\overset{|}{C}H}}-CH_2-\overset{\displaystyle CH_3}{\overset{|}{C}H}-C\equiv CH$

(iv) $(CH_3)_2CH-\overset{\displaystyle O}{\overset{||}{C}}-C(CH_3)_3$

(v) $CH_3-\overset{\displaystyle O}{\overset{||}{C}}-CH_2-COOH$