

CHEMISTRY HSSC-II

Time allowed: 2:35 Hours

Total Marks Sections B and C: 68

SECTION – B (Marks 42)

Q. 2 Answer the following questions briefly.

(14x3=42)

(i)	Write chemical equations to show what happens when following compounds are heated: a. $LiNO_3$ b. $NaNO_3$ c. $Mg(NO_3)_2$	03	OR	What is the difference between the functional groups present in the following pairs of compounds? a. Acid halides and Acid amides b. Ethers and Esters c. Aldehydes and Ketones	03
(ii)	Write down the electronic configuration of Copper and Chromium. Why these electronic configurations violate Aufbau principle?	2+1	OR	Describe the geometries of complex ions with co-ordination number 4 and 6	2+1
(iii)	State Fajan's rule and justify it by giving two examples.	1+2	OR	Write down the reactions of Acetic anhydride with a. H_2O b. NH_3 c. C_2H_5OH	03
(iv)	Justify that the restricted rotation about C-C bond in 1,2-dimethyl cyclo propane is responsible for geometrical isomerism.	03	OR	How can aldehydes and ketones be differentiated by giving two chemical tests?	03
(v)	Write down the mechanism of SN1 reactions.	03	OR	Write down three differences between addition and condensation polymerization.	03
(vi)	How $Cr_2O_7^{2-}$ and CrO_4^{2-} ions exist in equilibrium with one another? How can they be interconverted due to this equilibrium?	1+2	OR	Briefly describe enzyme inhibition? What are its types.	1+2
(vii)	How can 1-Butyne be prepared using a suitable vicinal dihalide and a geminal dihalide? Give chemical reactions with conditions.	03	OR	What is green house effect? Give its brief description.	1+2
(viii)	Write down the reactions of Phenol with conc. HNO_3 , aq. Br_2 and conc. H_2SO_4	03	OR	Describe the type of electronic transition that occurs when UV-Vis radiations of 200–800nm wavelength are passed through $CH_2 = CH - CH_2 - \ddot{O}H$	03
(ix)	Write down three differences between E1 and E2 reactions.	03	OR	Describe the significance of Functional group region and Finger print regions in the IR spectrum.	03
(x)	Justify that $Al(OH)_3$ is amphoteric but $Mg(OH)_2$ is basic.	2+1	OR	Write down the reactions of $CH_3 - CH_2 - Mg - Br$ with: a. Acetone b. CO_2	03
(xi)	Describe anomalous trends in the ionization energies of elements of 3 rd period in the periodic table.	03	OR	Why is Acetaldehyde more reactive than Acetone in nucleophilic addition reactions?	03
(xii)	Write down two reactions in which O–H bond of alcohol is broken. What is reactivity order of different alcohols in these reactions?	2+1	OR	What is the role of chloro-fluoro carbons (CFC) in destroying ozone layer in the stratosphere?	03
(xiii)	Write down the chemical reactions for the following observations: a. Calcium when heated in air (containing O_2 and N_2) results in the formation of two compounds b. One of the above two compounds reacts with water to form a pungent gas.	2+1	OR	Naturally occurring magnesium has three isotopes. $Mg - 24$ mass = 24amu % - age abundance = 78.70% $Mg - 25$ mass = 25amu % - age abundance = 10.13% $Mg - 26$ mass = 26amu % - age abundance = 11.17% Calculate relative atomic mass of Mg .	03
(xiv)	How can ethene be converted into: a. Ethanol b. Ethylene chlorohydrin	03	OR	Acetone undergoes aldol condensation reaction with a mild base. Write down the mechanism of this reaction of acetone.	03

SECTION – C (Marks 26)

Note: Attempt the following questions.

Q.3	Justify that CO_2 is an acidic oxide. How the dioxides of Ge , Sn and Pb differ in nature from CO_2 ? Explain by giving two chemical reactions for each in the support of your answer.	1+2+2 +2	OR	How is the refining of Crude oil carried out? State the basic principle involved and explain the steps in industrial process. (Do not describe the fractions)	1+1 +5
Q.4	Why Carbon and Silicon show +4 oxidation states whereas Ge , Sn and Pb show +4 as well as +2 oxidation states in their compounds? Explain. Also compare the relative stability of +4 and +2 oxidation states in Ge , Sn and Pb .	3+3	OR	Explain the structure of Benzene on the basis of molecular orbital concept. How does this concept justify the stability of benzene? Why does benzene preferably give electrophilic substitution reactions?	3+2+1
Q.5	How can Acetyl Chloride be prepared from carboxylic acid? Write down the reactions of $\begin{matrix} O \\ \\ CH_3 - C - Cl \end{matrix}$ with: a. Acetic acid b. Ethanol c. NH_3	06	OR	Describe lipids. How can essential and non-essential lipids be differentiated? Write down the following reactions of a general triglyceride: a. Hydrolysis b. Saponification	3+3
Q.6	What is mass spectrometry? Write down its basic principle. Explain the construction and working of a mass spectrometer.	1+1+5	OR	What is the order of acidic strength of phenol, alcohol and carboxylic acid? Justify your answer by giving pKa values, and stability of their conjugate bases.	1+2+2 +2

(B) —

SUPPLEMENTARY TABLE

Atomic No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Symbol	H	He	Li	Be	B	C	N	O	F	Ne	Na	Mg	Al	Si	P	S	Cl	Ar	K	Ca
Mass No	1	4	7	9	11	12	14	16	19	20	23	24	27	28	31	32	35.5	40	39	40