Class 10

CHEMISTRY

SSC-II (2023)

Q.1: Circle the correct option i.e A/B/C/D. Each part carries one mark.

1) Predict the unit of K_c for the following reversible reaction $N_2O_{4(g)} \rightleftharpoons 2NO_{2(g)}$

○ $mol^{-1}\,dm^{-3}$ ● $moldm^{-3}$ ○ $mol^{-1}dm^{-3}$ ○ $moldm^{3}$

2) A reaction in which products react together to reform the original reactants is called:

○ Endothermic reaction ○ Exothermic reaction ● Reversible reaction ○ Irreversible reaction

3) In an aqueous solution of hydrochloric acid the concentration of H^+ ion is 1 x 10^{-6} moldm^{-3}. This solution is:

●Acidic ○ Basic ○ Neutral Amphoteric

4) In a homologous series, two adjacent compounds differ by;

○ $-CH_3$ group ● $-CH_2$ group ○ $-CH$ group ○ $-CH_4$ group

5) IUPAC name of C_8H_{18} is:

● Octane ○ Octene ○ Octyne Octanal

6) Which of the following is an aldehyde?

○ CH_3CH_2-OH ○ CH_3OCH_3 ○ CH_3COOH ● CH_3-CHO

7) In organic chemistry the term dehydrohalogenation means:

○ Removal of water only ○ Removal of halogen only ● Removal of hydrogen and halogen ○ Removal of water and halogen

8) Identify the monosaccharide from the following carbohydrates;

●Glucose ○ sucrose ○ Lactose ○ Maltose

9) 1 Kilogram of water will occupy minimum space at:

○ 0°C ○ 100°C ○ -4°C ● 4°C

10) The lowest temperature in stratosphere is:

○ -5°C ● -55°C ○ 5°C ○ 55°C

11) Which of the following gases is used to destroy harmful bacteria in water?

○ Fluorine ○ Bromine ● Chlorine ○ Iodine

12) Which of the following organic compound is found in gasoline (Petrol)?

○ $C_{20}H_{42}$ ○ $C_{14}H_{28}$ ○ $C_{12}H_{26}$ ● C_8H_{18}

CHEMISTRY SSC–II

Time allowed: 2:40 Hours **Total Marks Sections B and C: 53**

NOTE: Answer any eleven parts from Section 'B' and attempt any two questions from Section 'C' on the separately provided answer book. Write your answers neatly and legibly.

SECTION – B (Marks 33)

Q. 2 Answer any ELEVEN parts from the following. All parts carry equal marks. (11 x 3 = 33)

(i) State the necessary conditions for chemical equilibrium.

(ii) Identify Bronsted acids and bases in the following reactions.

(a) $HCN + H_2O \rightleftharpoons H_3O^+ + CN^-$

(b) $H_2O + CO_3^{-2} \rightleftharpoons HCO_3^- + OH^-$

(c) $HS^- + H_2O \rightleftharpoons S^{-2} + H_3O^+$

(iii) Calcium carbonate ($CaCO_3$) is used to make buildings. It can be made by neutralization reaction of calcium hydroxide $Ca(OH)_2$ with carbonic acid H_2CO_3. Write down its complete and balanced chemical equation.

(iv) Identify and encircle the functional group in the following compounds. Also give names of classes of functional groups.

(a) $CH_3 - C \equiv CH$ (b) $CH_3CH_2 - \overset{\overset{O}{\|}}{C} - H$ (c) $CH_3 - CH_2 - O - CH_3$

(v) Predict the molecular formula, structural formula and condensed structural formula for Hexane.

(vi) Identify the products and complete the following reactions.

(a) $CH_3 - Cl + 2[H] \xrightarrow[HCl_{(aq)}]{Zn}$

(b) $CH_2 = CH - CH_3 + H_2 \xrightarrow[200°-300°C]{Ni}$

(vii) Identify A and B in the following reactions $CH_2 = CH - Cl + KOH \xrightarrow{alcohol} A \xrightarrow[Ni\ 200°-300°C]{H_2} B$

(viii) What is meant by industrial wastes in water? Identify any three health problems caused by industrial wastes.

(ix) Identify the functional groups in a typical amino acid. Draw a peptide linkage between two amino acids.

(x) Nitrogen dioxide is a redish brown toxic gas. Write down its harmful effects.

(xi) What is meant by the term 'green house gases'? What is their role in global warming?

(xii) Density of most of the liquids decreases on heating and increases on cooling. Water shows strange behaviour in this regard. Discuss briefly.

(xiii) How does CO_2 react with ammoniacal brine in Solvay's process? Write down the reactions.

(xiv) Describe the following terms.

a) Petroleum b) Fractional distillation

(xv) How does methane react with chlorine in direct sunlight? What is the trend in reactivity of halogens with an alkane?

SECTION – C (Marks 20)

Note: Attempt any TWO questions. All questions carry equal marks. (2 x 10 = 20)

Q. 3 a. Explain the manufacturing of urea in two steps with the help of chemical reactions. Also enlist the uses of urea.

b. What is meant by Lewis acid and Lewis base? Classify the following substances as Lewis acid or Lewis base. $AlCl_3$, CN^-, H_3O^+, NH_3

Q. 4 a. Describe the methods to remove temporary hardness of water.

b. Enlist the names of layers of atmosphere. Explain the first two layers which are nearest to the earth.

Q. 5 a. Write down the macroscopic characteristics of a reversible chemical reaction.

b. How are vitamins important to fight against diseases? Give a summary

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