Class- 12
SAMPLE PAPER, MARCH 2021
SUBJECT – Chemistry

Time : 3 hrs. **M. M. – 70 Marks**

NOTE : Q. No. 1 has 28 parts carrying 1 mark each.

Q. No. 2 to 8 carry 2 marks each.

Q. No. 9 to 14 carry 3 marks each.

Q. No. 15 to 16 carry 5 marks each.

Q.1 Multiple Choice Questions

i. The depression in freezing point for 1 M urea, 1 M glucose and 1 M NaCl are in the ration.
(a) 1:2:3 (b) 3:2:2 (c) 1:1:2 (d) None of the above.

ii. A pressure cooker reduces cooking time because:
(a) heat is more evenly distributed
(b) the higher pressure tenderises the food
(c) the boiling point of water inside the cooker is elevated.
(d) the boiling point of water inside the cooker is depressed.

iii. In which mode of expression, the concentration of solution remains independ ent of temperature?
(a) Molarity (b) Normality (c) Formality (d) Molality

iv. Find the mass of glucose that should be dissolved in 50g of water in order to produce the same lowering of vapour pressure as produce by dissolving 1 g of urea in the same quantity of water.

(a)1g (b) 3g (c) 6g (d) 9g

v. Which of the followings have lowest boiling point?

(a) He. (b) Ne (c) Ar (d) Na

vi. Which of the following alcohol will be most reactive towards Lucas Reagent?

(a) Methyl alcohol (b) Primary alcohol
(c) Secondary alcohol (d) Tertiary alcohol

vii. How many ions are produced from the complex $[Co(NH_3)_6]Cl_2$ in solution?

(a) 6 (b) 4 (c) 3 (d) 2

viii. Amongst the following, the most stable complex is

(a) $[Fe(H_2O)_6]^{3+}$ (b) $[Fe(NH_3)_6]^{3+}$ (c) $[Fe(C_2O_4)_3]^{3-}$ (d) $[FeCl_6]^{3-}$

ix. Which among the followings is known as Invert sugar?
(a) Glucose b) Maltose (c) Sucrose (d) Fructose

x. Which among the followings is Fibrous protein ?
(a) Albumin (b) Keratin (c) Insulin (d) None of the above

xi. Gabriel phthalimide is used for preparation
(a) Aromatic amines (b) Secondary amines
(c) Tertiary amines (d) Primary aliphatic amines

xii. Which among the followings is most basic in aqueous solution
(a) primary methyl amine (b) aniline
(c) sec-methylamine (d) tert-methylamine

xiii. Which among the followings is most acidic?
(a) Acetic acid (b) Formic acid
(c) Chloroacetic acid (d) Ethanol

xiv. Which among the followings undergoes aldol condensation?
(a) Methanal (b) Benzaldehyde
(c) Propanal (d) None of above

xv. The colour of precipitates in Iodoform reaction is
(a) White (b) Yellow (c) Orange (d) Brown

xvi. In clemmensen reduction aldehyde changes into
(a) Alcohol (b) Alkene (c) Alkane (d) Alkyne

xvii. One Faraday contains the charge
(a) 95000C (b) 96500 C (c) 94500 C (d) 95600 C

xviii. The metal with minimum enthalpy of atomisation is
(a) Hg (b) Mn (c) Fe (d) Cu

Comprehension

Lyophilic sols are more stable than lyophobic sols. This is due to the fact that lyophilic colloids are extensively solvated, i.e., colloidal particles are covered by a sheath of the liquid in which they are dispersed.
Lyophilic colloids have a unique property of protecting lyophobic colloids. When a lyophilic sol is added to the lyophobic sol, the lyophilic particles form a layer around lyophobic particles and thus protect the latter from electrolytes. Lyophilic colloids used for this purpose are called protective colloids

Answer the followings

xix. Which type of colloids are stable in nature?
xx. Define lyophilic colloids.
xxi. Which type of colloids undergo solvation?
xxii. What are protective colloids?
xxiii. How protection of colloids can be done?

True/False

xxiv. Haloalkanes are more reactive than haloarenes. (T/F)
xxv. Alcohols react with sodium metal to release hydrogen gas. (T/F)
xxvi. Carboxylic acids are more acidic than phenols. (T/F)
xxvii. Glycogen is called animal starch. (T/F)
xxviii. Amines have greater boiling point than alcohols. (T/F)

Section-B Two Mark Questions

Q2. Sodium chloride solution freezes at lower temperature than water but boils at higher temperature than water. Explain.

Q3. Boiling point of water 750mm Hg is 96·63 degree Celsius . How much sucrose is to be added to 500g of water such that it boils at 100 degree Celsius? Molal elevation constant for water is 0.52 K kg mol^{-1}

OR

The vapour pressure of pure liquids A and B are 450 and 700mm Hg at 350 K respectively. Find out the composition of the liquid mixture if total vapour pressure is 600mm Hg. Also find the composition of the vapour phase.

Q4. Define conductivity and molar conductivity for the solution of an electrolyte. Discuss their variation with concentration.

Q5. Calculate the half-life of a first order reaction from their rate constant is 200 s^{-1}

OR

A reaction is first order in A and second order in B.

(i) Write the differential rate equation.

(ii) How is the rate affected on increasing the concentration of B three times?

Q6. Why do noble gases have large atomic size?

OR

Which form of sulphur shows paramagnetic behaviour and why?

Q7. Compare and explain bond angles of H_2O and H_2S.

Q8. What are interstitial compounds? Why are such compounds well known for transition metals.

Q9. Why are Mn^{2+} compounds more stable than Fe^{2+} towards oxidation to their +3 state?

Q10. What is meant by unidentate and ambidentate ligands? Give two examples for each.

OR

$[Fe(CN)_6]^{4-}$ and $[Fe(H_2O)_6]^{2+}$ are of different colours in dilute solutions. Why?

Q11. Explain the factors affecting rate of a reaction.

Section-C Three Mark Questions

Q12. Calculate the potential of hydrogen electrode in contact with a solution whose pH is 10.

Q13. Compare and explain the reactivity of different alcohols towards sodium.

OR

Compare and explain the acidic nature of alcohol and phenols.

Q14. For a first order reaction, show that time required for 99% completion is twice the time required for the completion of 90% of reaction.

OR

A first order reaction takes 40 min for 30% decomposition.
Calculate half life period.

Q15. Why is dioxygen a gas but sulphur a solid?

Section-D Five Mark Questions

Q16. Explain giving reasons-

(i) Transition metals and many of their compounds show paramagnetic behav iour. (1)
(ii) The enthalpies of atomisation of the transition metals are high. (2)
(iii) The transition metals generally form coloured compounds. (2)

OR

(i) Transition metals and their many compounds act as good catalyst. (2)
(ii) Of the d^4 species, Cr^{2+} is strongly reducing while manganese is strongly oxidis ing. (2)
(iii) The d^1 configuration is very unstable in ions.(1)

Q17. What happens when-

(i) n-butyl chloride is treated with alcoholic KOH
(ii) bromobenzene is treated with Mg in the presence of dry ether
(iii) ethyl chloride is treated with aqueous KOH
(iv) methyl bromide is treated with sodium in the presence of dry ether
(v) methyl chloride is treated with KCN ?

OR

Give the following reactions-

(i) Sandmeyer's reaction
(ii) Finkelstein reaction
(iii) Hundsdiecker reaction
(iv) Fittig reaction
(v) Ullmann reaction